ENERGY MANAGEMENT SOFTWARE

POWERSTUDIO

(Standard, SCADA, Deluxe)

Version 4.0

USER MANUAL 4 / 4

(M98232101-03-13A)

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LOG OF REVISIONS

Date	Revision	Description
11/13	M98232101-03-13A	Original version

1.- DEVICES

1.1.- DRIVER OPTION CONFIGURATION

Device options may be accessed from

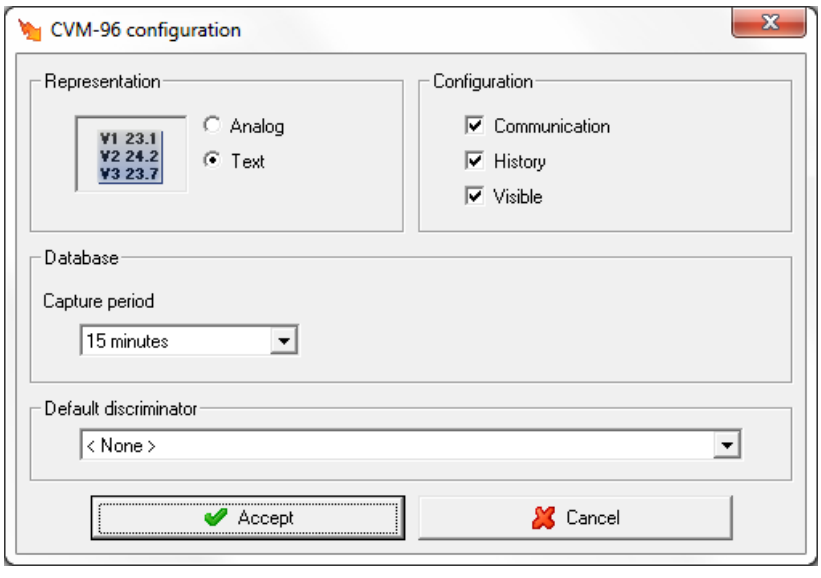
- *View Menu:* Refer to 'Editor manual'.
- *Toolbar*. Refer to 'Editor manual'.

The options menu for a CVM-96 device will be the following:

In this section those options which are common to all or the majority of the drivers are described.

These options are described using the CVM-96 device as an example. It is possible that other devices need to configure other types of options, which are not described in this section, in which case detailed explanation will be contained in the corresponding device section.

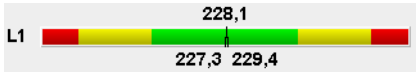
1.1.1 Driver parameters



From this screen we can configure the variable display type on screen and configure where to save the data files.

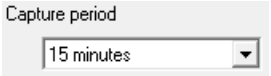
There are two types of data representation.

Analogue representation, the variables are graphically represented by bars as



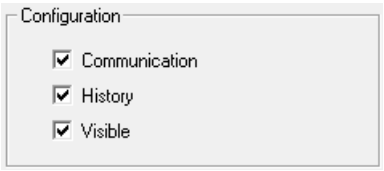
Where instantaneous value, maximum and minimum values are represented.

Text mode representation, the variables are represented as



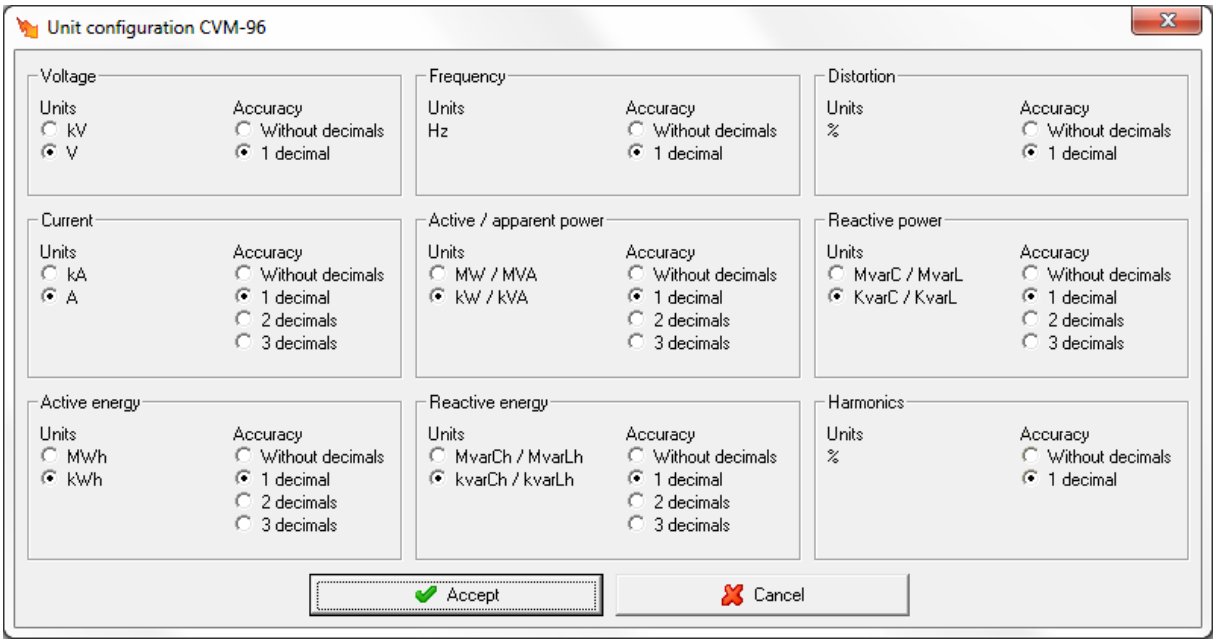
The capture period is entered into this field. This indicates the time interval which elapses between the device history recordings. The periods permitted are 10, 15, 20 and 30 seconds, 1 minute and multiples up to a maximum of 60 minutes.

This selector will assign a default filter to the device. This option appears only in those devices possessing variables that can be filtered. If we select a filter, when making graphs or tables, the variables are displayed initially as filtered, although it is also possible to see the variables without the filter, or see them through a filter other than the default one.

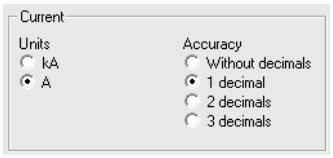
Using 

we can activate or deactivate communication with a device, decide whether or not to save device histories and whether or not to allow a user to see a device from the client.

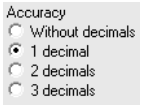
1.1.2 Variable units



Use this dialogue to configure units and the number of decimals with which to display the variables on screen. This type of configuration only affects the value display on the screen and does not affect the equipment.

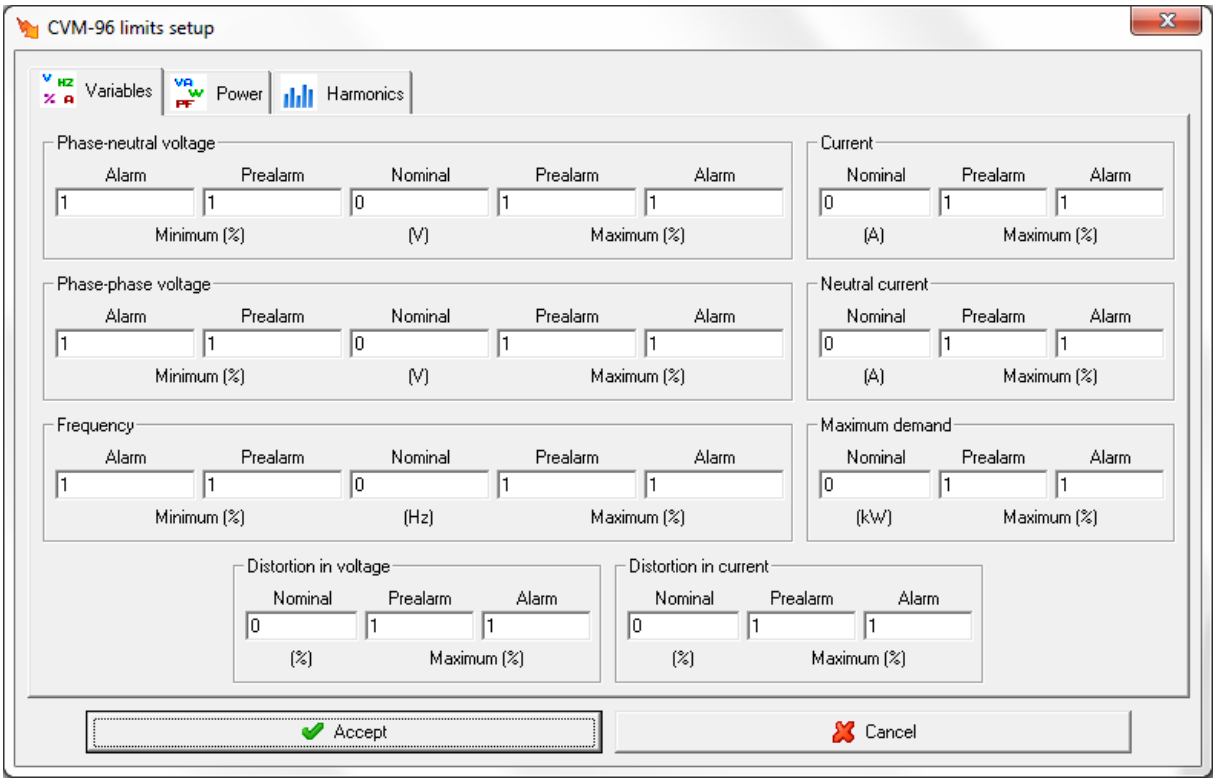


The units in which the variables are shown are selected. In this case all the current variables will appear in A.

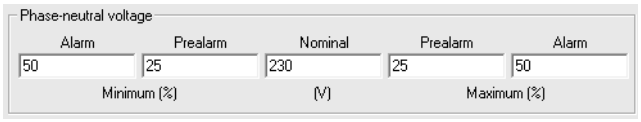


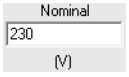
The precision when displaying the variables is selected. In this case all the current variables are shown with 3 decimals.

1.1.3 Variable limits

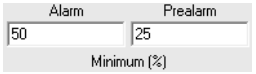


Use this dialogue to configure nominal variable values, as well as a series of margins to display on screen when a variable measures unusual values.

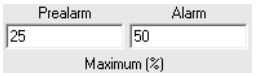




Nominal variable value. The units used to express this value are indicated in brackets. If the nominal value is 0, the alarm is disabled. For the power factor, the nominal value should be 1 to enable the alarm or 0 to disable it.



Percentage of nominal value for the pre-alarm or alarm signal. In this case when the variable value is between 25% and 50% below the nominal value, there will be a pre-alarm signal, if it is below 50% the alarm will sound. For the power factor the desired alarm and pre–alarm between +0.0 and -0.0 are entered directly.



Percentage of nominal value for the pre-alarm or alarm signal. In this case when the variable value is between 25 and 50% above nominal value, there will be a pre-alarm signal, if it is above 50% the alarm will sound. For the power factor the desired alarm and pre–alarm between +0.0 and -0.0 are entered.

If the pre-alarm value is equal to the alarm value, the pre-alarm zone will be disabled, passing directly from the normal state to the alarm status.

1.2.- AFQ (Active filter)[1]

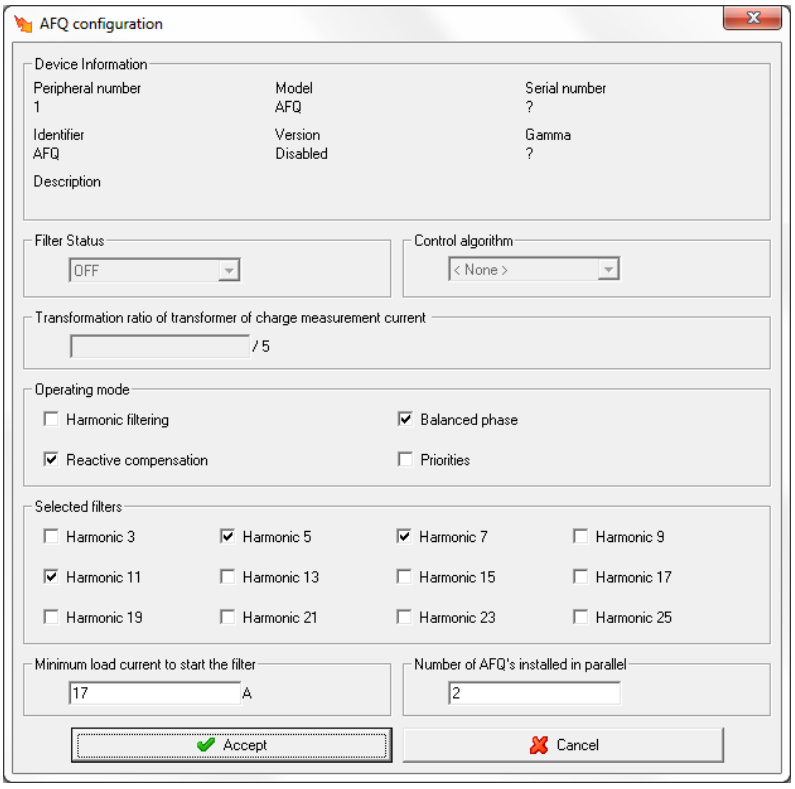
1.2.1 Driver options

Options menu:

The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.2.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

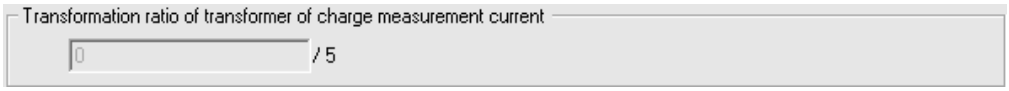


[1] Only in version 3.3 or greater

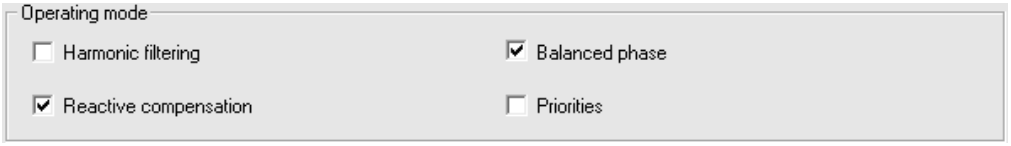
Displays general information about the device.

Displays the filter status, (ON/OFF); this field cannot be edited.

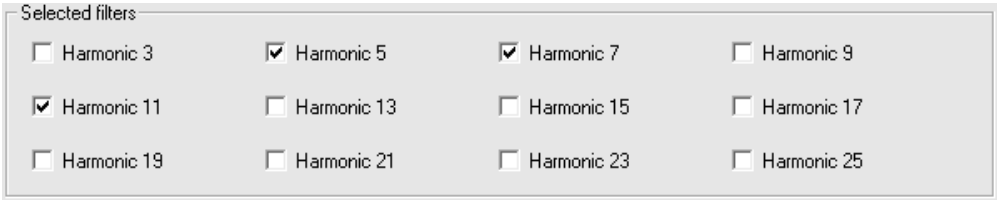
Displays the control algorithm, there are two options (*Frequency method* or *Temporal method*); this field cannot be edited.



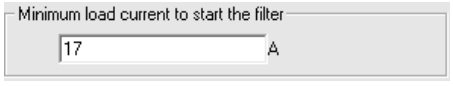
Displays the transformation ratio for the load current measurement transformer; this field cannot be edited either.



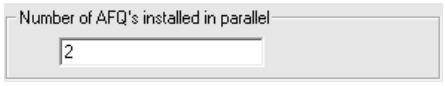
Configuration of the operating mode; the four modes can be selected at the same time.



Option for selecting harmonics in the selective filtration.



Displays the minimum load current to start the filter.

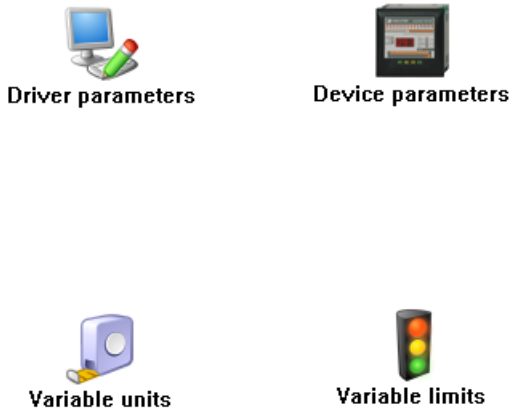


Displays the number of AFQs installed in parallel; the value must be between 1 and 8, inclusively.

1.3.- C-14d

1.3.1 Driver options

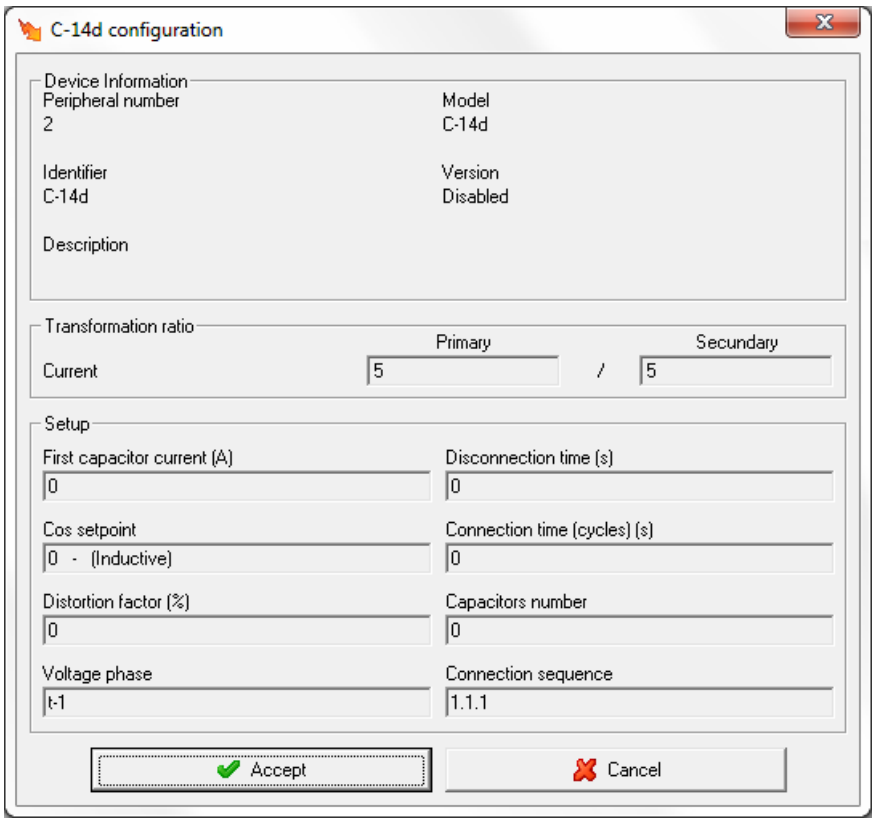
Options menu:



The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

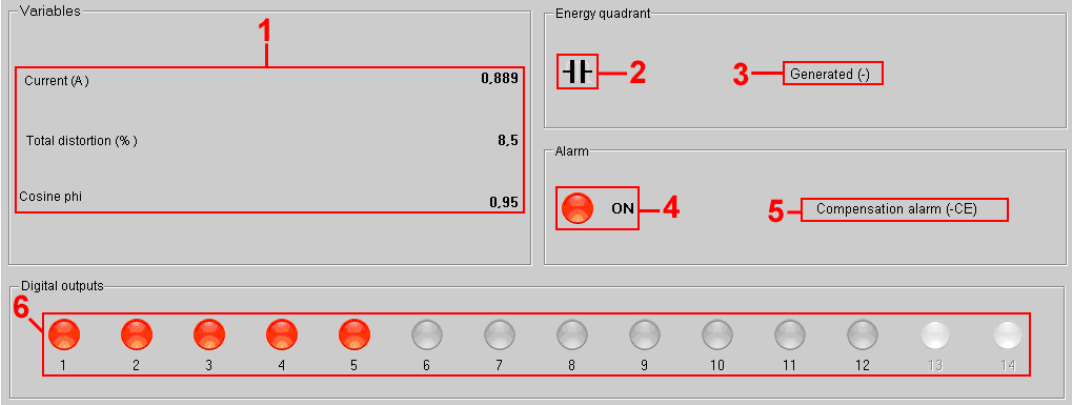
1.3.1.1 Device parameters

In the case of C-14d it will not be possible to configure any parameters of the device, only information about it will be shown.



1.3.2 Displaying values

The C-14d device will show the following values screen:



Where:

1. Instant values measured by the device.
2. Energy quadrant.
   - Inductive.
   - Capacitive.
   - Cos Phi = 1.
3. Description that indicates if the energy is consumed or generated.
4. Alarm status:
   - Status OFF. Alarm disabled.
   - Status ON. Alarm enabled.
5. Description of the enabled alarm. Will not appear if no alarms are enabled.
6. Status of the output relays:
   - Relay disconnected.
   - Relay connected.
   - Relay disabled. The relay is not used by the device.

1.4.- IP Camera

The IP Camera device only allows a captured image to be displayed, either by connecting directly with a camera with an Ethernet connection, a video recorder to which petitions can be made or webcams.

It will not be possible to record, display recordings or carry out any other action on the image displayed, such as motion detection, from the sources described above.

The IP Camera device can display images generated from different sources (IP cameras, videos, webcams, etc.), provided web requests can be made to these sources and the response is a still image in JPEG format or video streaming MJPEG format.

1.4.1 Adding an IP Camera

For more information on how to add a device refer to 'Editor Manual'. The following parameters are used to configure communication with an IP camera device.

- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Enter a brief description of the device using alphanumeric type data.
- **IP Address:** Corresponds to the address through which the program can communicate with the device. This parameter can be an IP address or a name.
- **Port:** Corresponds to the communications port.
- **Type:** Type of image returned by the device. Video may be displayed in either MJPEG format or still picture
- **Refresh each image:** Only used for fixed images; dictates how often in seconds the program should request a new image.
- **Route/Request:** Corresponds to the request that must be made to the device to obtain the video or image requested.

- **Search:** By clicking on this button, the program will try to find the device at the address and port configured, using the most frequent routes / requests.

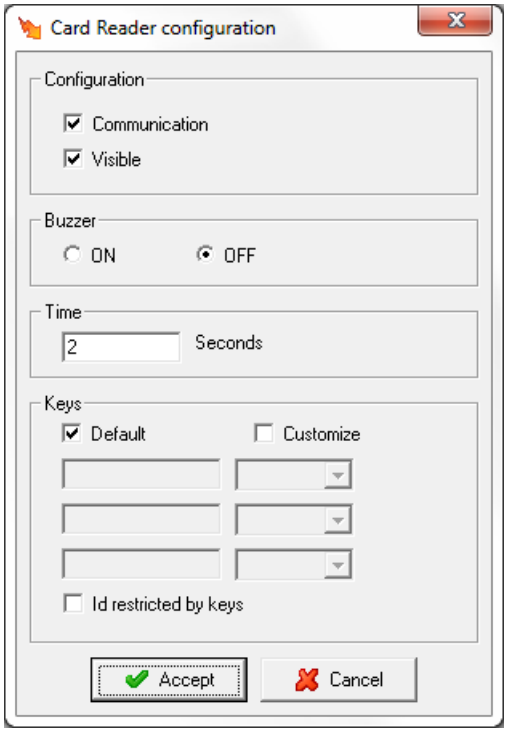
For more information on which route or request should be used, consult the device manual or contact your distributor.

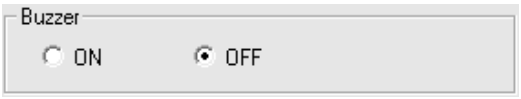
1.5.- TAG READER

1.5.1 Driver options

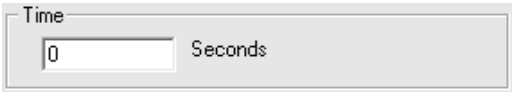
Options menu:

1.5.1.1 Driver Parameters

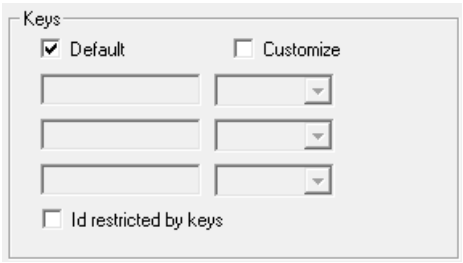




Activate or deactivate the device buzzer.



Allows you to assign a time in seconds during which the value of the tag read will be kept before deleting.

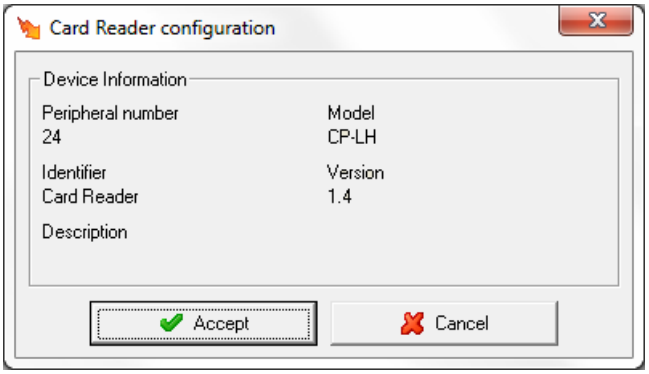


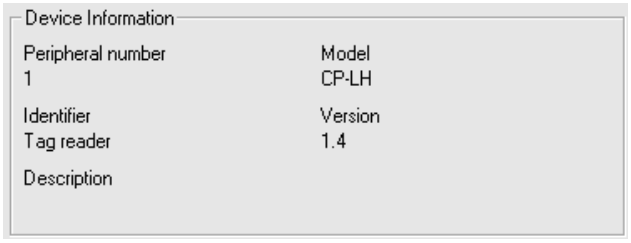
Configures the read/write keys required to access the cards.

The remaining screen parameters are detailed in section 1.1.1 Driver parameters.

1.5.1.2 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.





Displays general information about the device.

1.6.- CBS-4 /CBS-4 RA

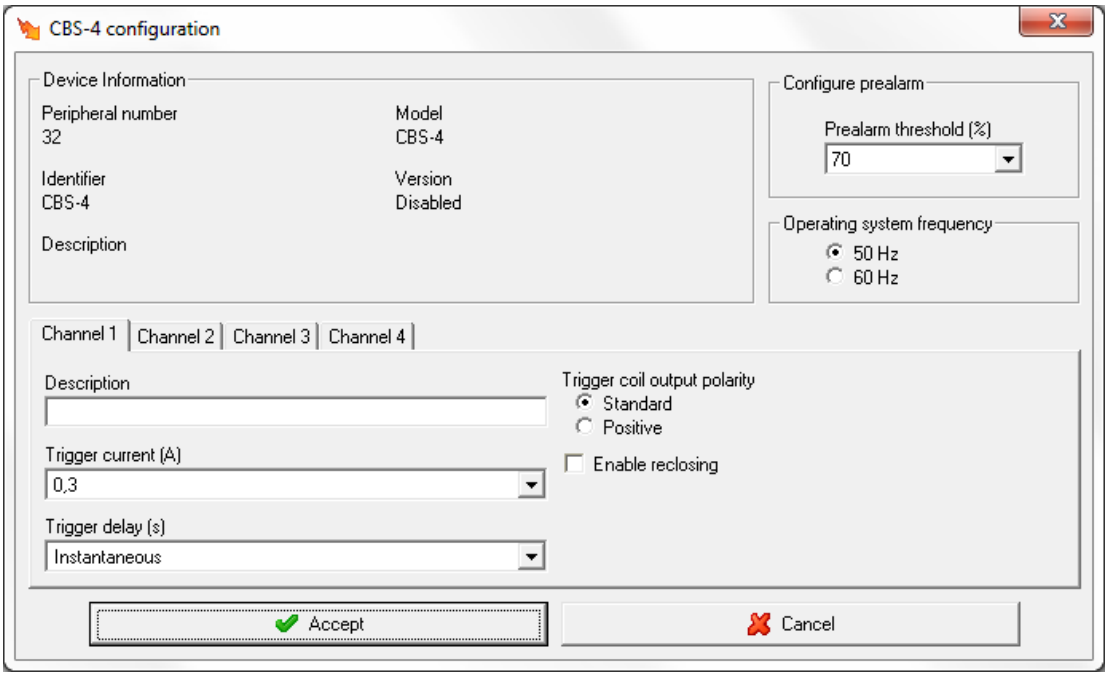
1.6.1 Driver options

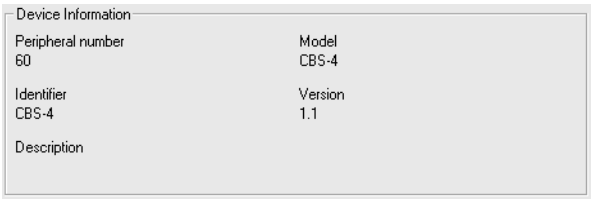
Options menu:

1.6.1.1 Device parameters

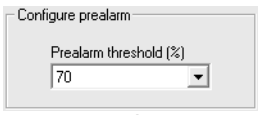
This screen allows the internal parameters of the device to be configured. Upon opening the dialogue box, the software will read the device configuration. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

1.6.1.1.1 CBS-4

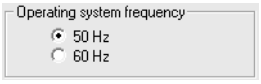




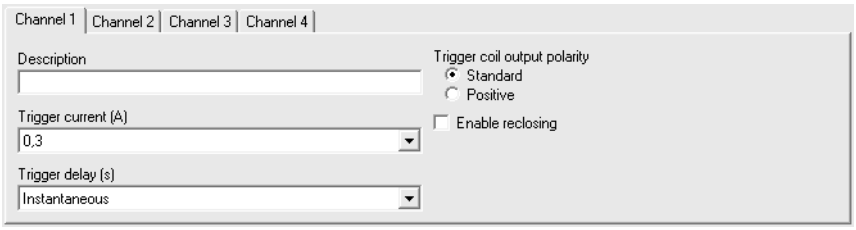
Displays general information about the device.



Equipment pre-alarm threshold. This can vary between 50 and 100% of the device channels minimum trigger threshold.



Enables selection of the device connection working network frequency.



Displays the channel configuration.

As it is only possible to display the configuration of one channel at a time, click on one of the channels to display the corresponding configuration.

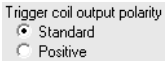
Alphanumeric type information where a brief description of the channel can be entered for easy identification.

Indicates the maximum current that can be reached by the device before triggering. The values that can be acquired are:

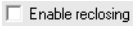
Disabled	0.03 (A)	0.1 (A)
0.3 (A)	0.5 (A)	1 (A)
3 (A)	5 (A)	10 (A)
30 (A)		

Channel delay time , the possible values are:

Instantaneous:	Selective	20 ms
100 ms	200 ms	300 ms
400 ms	500 ms	750 ms
1s	3s	5s
10s		

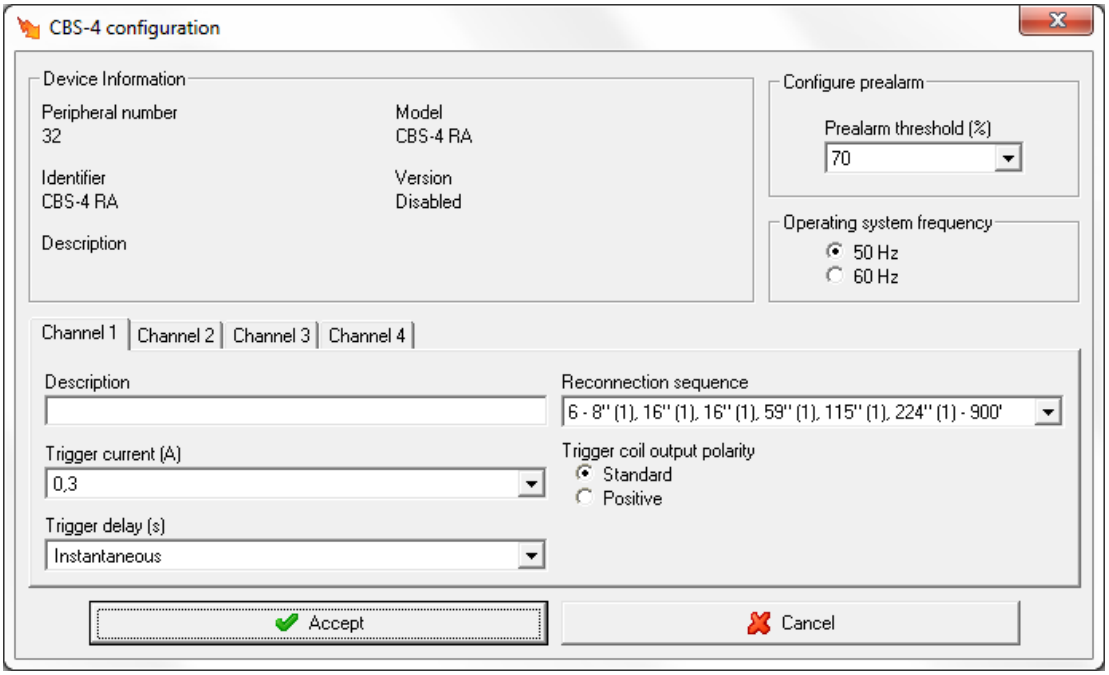


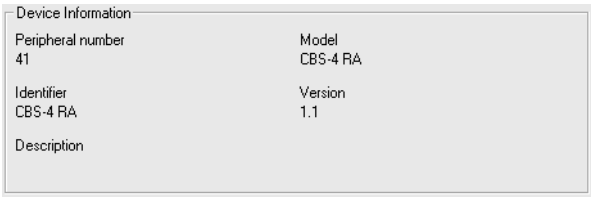
Configuration of the polarity of the output relay of the relay output trigger coil, allowing one of the two options possible to be selected (standard or positive).



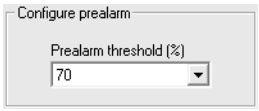
If this option is selected, when triggering takes place, the device will try to reconnect the channel.

1.6.1.1.2 CBS-4 RA

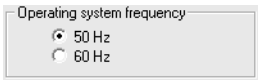




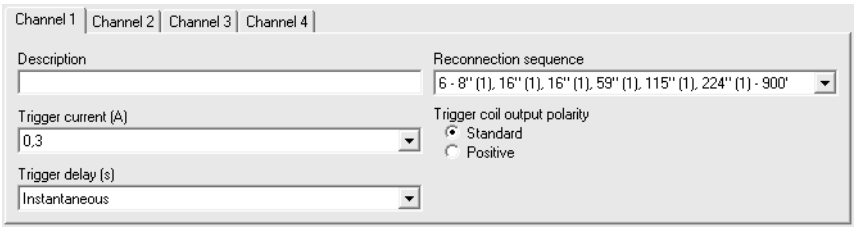
Displays general information about the device.



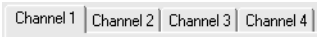
Equipment pre-alarm threshold. This can vary between 50 and 100% of the device channels minimum trigger threshold.



Enables selection of the device connection working network frequency.



Displays the channel configuration.

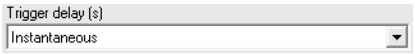


As it is only possible to display the configuration of one channel at a time, click on one of the channels to display the corresponding configuration.

Alphanumeric type information where a brief description of the channel can be entered for easy identification.

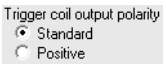
Indicates the maximum current that can be reached by the device before triggering. The values that can be acquired are:

Disabled	0.03 (A)	0.1 (A)
0.3 (A)	0.5 (A)	1 (A)
3 (A)	5 (A)	10 (A)
30 (A)		



Channel delay time , the possible values are:

Instantaneous:	Selective	20 ms
100 ms	200 ms	300 ms
400 ms	500 ms	750 ms
1s	3s	5s
10s		

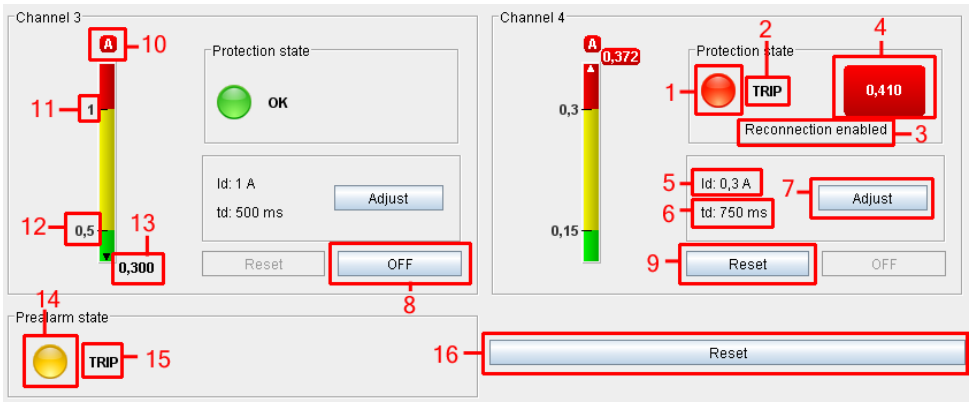


Configuration of the polarity of the output relay of the relay output trigger coil, allowing one of the two options possible to be selected (standard or positive).

Enables selection of the channel reconnection sequence. The information displayed will be xx – yy – zz where xx corresponds to the number of reconnections, yy to the time sequence and zz to the reset time.

1.6.2 Displaying values

Where:



1. Relay status:
   - Correct.
   -
   - Tripped.
2. Protection status:
   - Correct. Channel not tripped.
   - Toroid error. An error has been detected in the connection with the toroid coil.
   - Trip. Channel tripped.
3. Reconnection enabled. Reports that channel reconnections have been enabled.

4. Differential current value detected when the channel triggers. If the value detected is twice the trigger threshold configured it is shown in purple.

5. Trigger current configured.

6. Delay time configured.

7. Adjustment button. Enables programming of sensitivity and channel delay.

8. OFF button. External disconnection of the channel. The button will remain disabled if the channel has been triggered.

9. Reset button. Push the button to restart the channel.The button will remain disabled if the channel has not triggered.

10. Current value display units.

11. Channel trigger threshold value configured.

12. Channel pre-alarm value configured.

13. Channel Instantaneous differential current value. When the channel instantaneous differential current value exceeds the limits of the values bar, either by excess or default, it will be indicated as shown in the figure (arrow in the bar).

14. Pre-alarm status:

    - Disabled status.
    - Triggered status.

15. Additional information on the status of the pre-alarm.

16. Reset button. Resets all the device channels that are triggered.

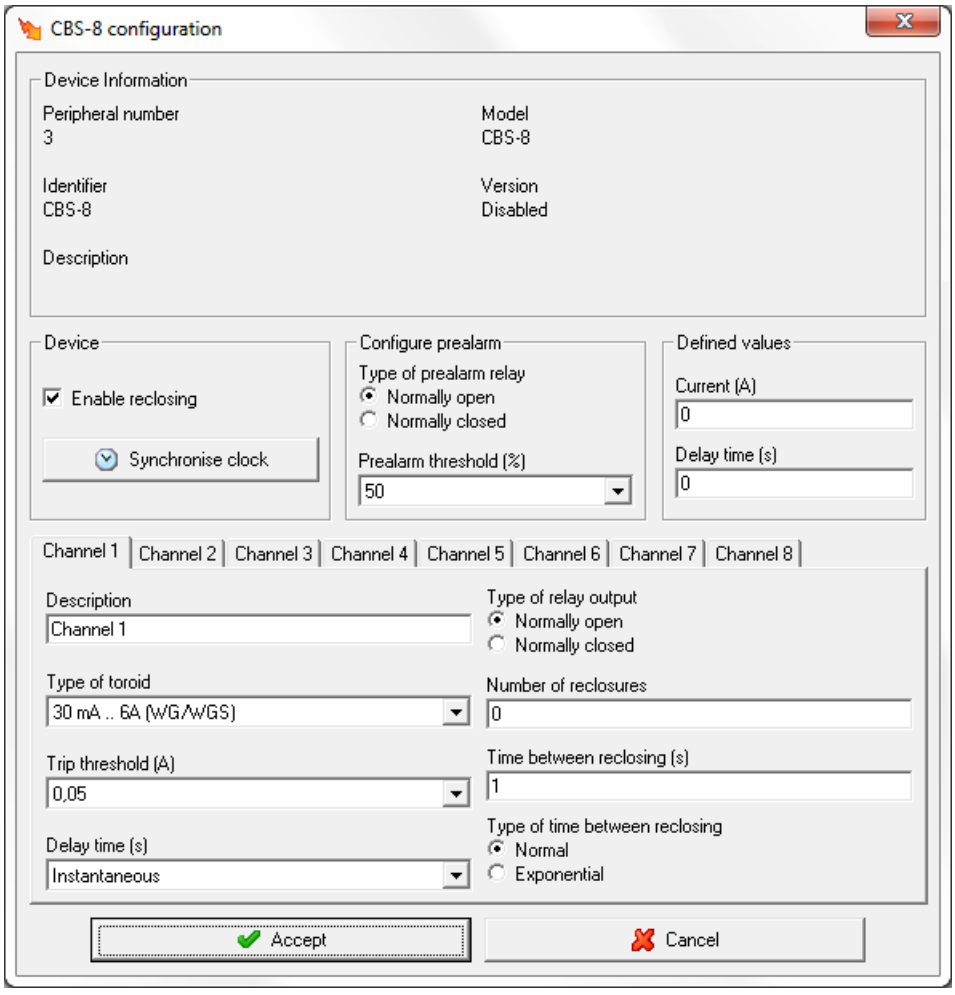
1.7.- CBS-8

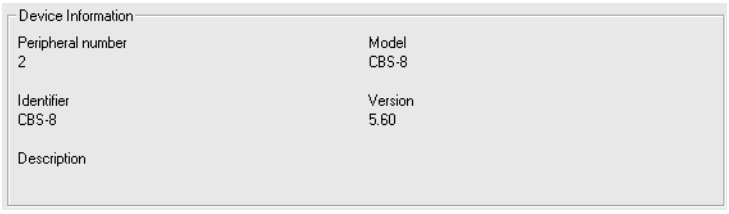
1.7.1 Driver options

Options menu:

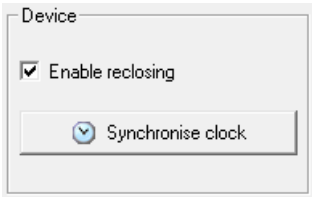
1.7.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "*Accept*" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

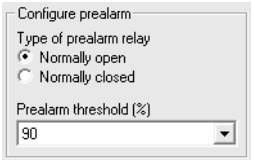




Shows general information.

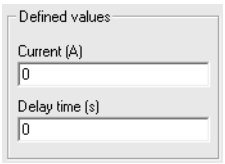


This selector allows the equipment to have the channel reconnections enabled or not. Depending on whether the reconnections of the configuration fields of the channels are enabled or not. Clicking on the button '*Synchronize clock*' the present time will be sent to the PC.

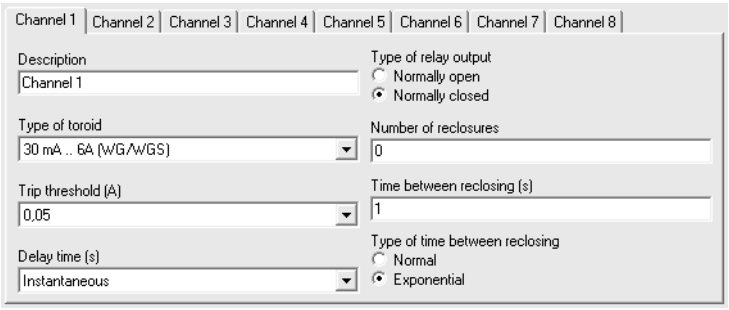


The following can be configured:

- *Type of pre-alarm relay.* Operation method of the pre-alarm relay common to all channels of the device.
- *Pre-alarm threshold.* Pre-alarm threshold the equipment possesses. This can vary between 50 and 100% of the minimum trigger threshold of the device channels.



A trigger threshold and a personalized delay time can be configured by the user. These parameters are common to all channels of the device. Depending on the type of channel selected, the customized threshold may be selected or not.



Shows the channel configuration.

As it is only possible to display the configuration of one channel at a time, click on one of the channels to display the corresponding configuration.

Alphanumeric type information where a brief description of the channel can be entered to for easy identification.

Toroid type connected to the channel. There are three possible options for selection:

- Channel disabled
- Fullscale channel with 6A (30mA .. 6A)
- Fullscale with 60A (300mA .. 60A)

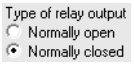
Channel trigger threshold, depending on the type of toroid connected the values available will be:

Toroid 30 mA 6… A		Toroid 300 mA 60A ...	
30 mA	1 A	300 mA	10 A
50 mA	1.5 A	500 mA	15 A
100 mA	2 A	1 A	20 A
200 mA	2.5 A	2 A	25 A
300 mA	3 A	3 A	30 A
400 mA	3.5 A	4 A	35 A
500 mA	4 A	5 A	40 A
600 mA	4.5	6 A	45 A
700 mA	5 A	7 A	50 A
800 mA	5.5 A	8 A	55 A
900 mA	6 A	9 A	60 A
Customized [1]		Customized	

[1] Only if the value of the customized trigger threshold does not exceed 6A

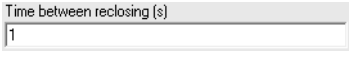
Channel delay time, the possible values are:

Instantaneous:	Selective	0.1 s
0.4 s	0.8 s	1 s
3 s	5 s	10 s
Customized		

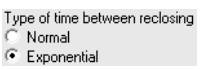


Channel output relay operating mode.

Number of attempts at reconnection. After this number the relay will be locked.



Time interconnections.

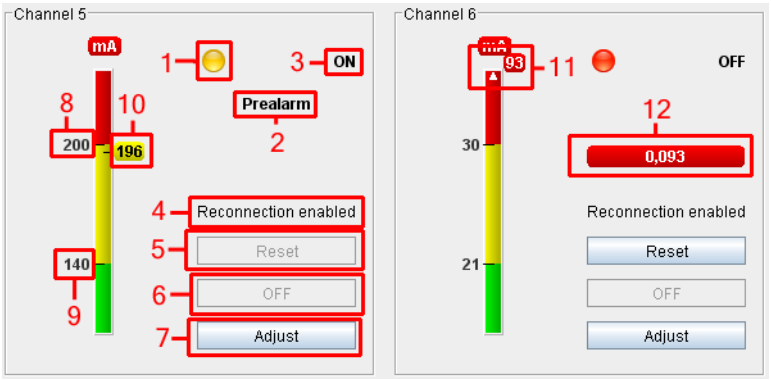


Operating mode in the time interconnections.

1.7.2 Displaying values

The CBS-8 device will show the following value screen:

Where:



1. Channel status:
   - Status ON.
   - Pre-alarm status.
   - Status OFF.
2. Relay status:
   - ON. Non-locked channel.
   - OFF. Channel locked.
3. Additional information on the status of the channel:
   - *Pre-alarm:* Pre-alarm enabled
   - *Reconnection:* Channel disconnected with timed reconnection process.
   - *Remote:* Channel disconnected by external triggering, cannot be automatically reconnected.

4. Reconnection enabled. Reports that channel reconnections have been enabled.

5. Reset button. If the channel is triggered, the button will remain disabled. Push the button to restart the channel.

6. OFF button. External disconnection of the channel. The button will remain disabled if the channel has not been triggered.

7. Adjustment button. Enables programming of sensitivity and channel delay. Channel information is also shown.

8. Channel trip threshold value configured.

9. Channel pre-alarm value configured.

10. Channel instantaneous differential current value.

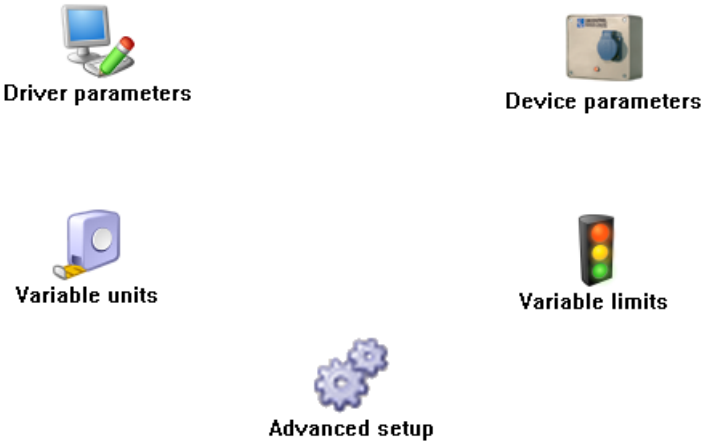
11. When the channel Instantaneous differential current value exceeds the limits of the value bar, either in excess or default, this will be indicated as shown in the figure (arrow below the value).

12. Differential current value detected when the channel triggers.

1.8.- CCL

1.8.1 Driver options

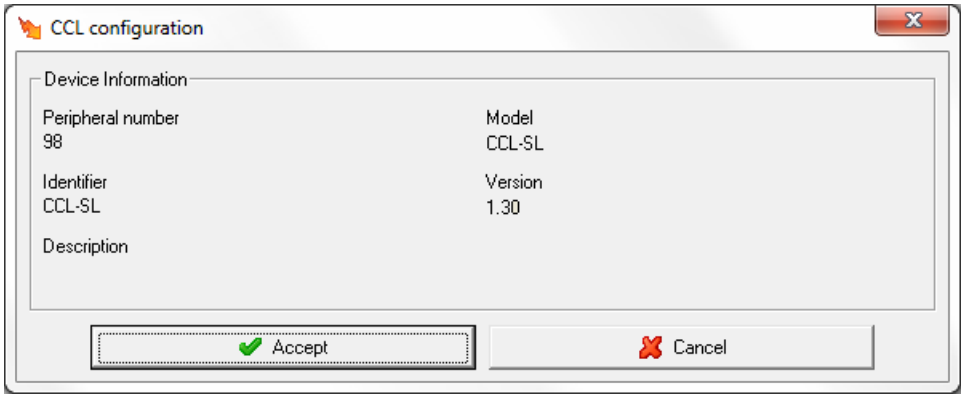
Options menu:

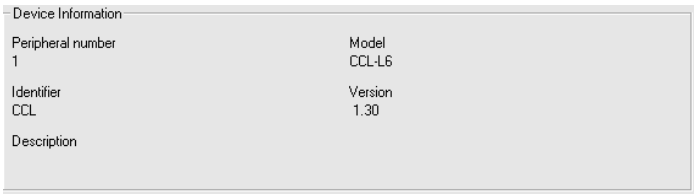


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.8.1.1 Device parameters

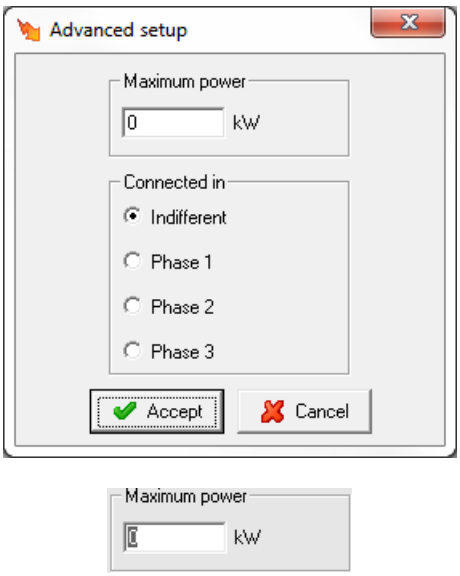
This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.



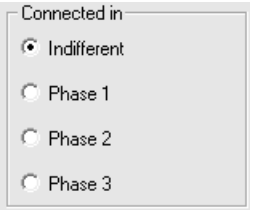


Displays general information about the device.

1.8.1.2 Advanced configuration



Allows you to assign a maximum power value to be used by the device.



Allows you to select the device connection mode: single-phase or three-phase.

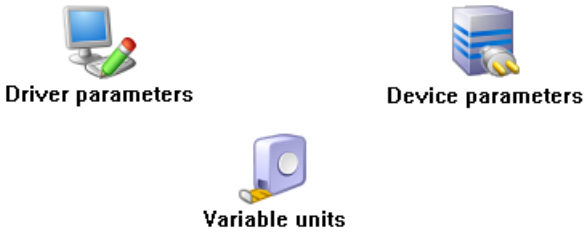
1.9.- CCLEngine

The CCLEngine driver allows the management of one or several CCL devices for vehicle recharging.

It will allow you to assign the CCL device(s) with a card reader from which recharges will be authorised and discounted, as well as obtain information on these.

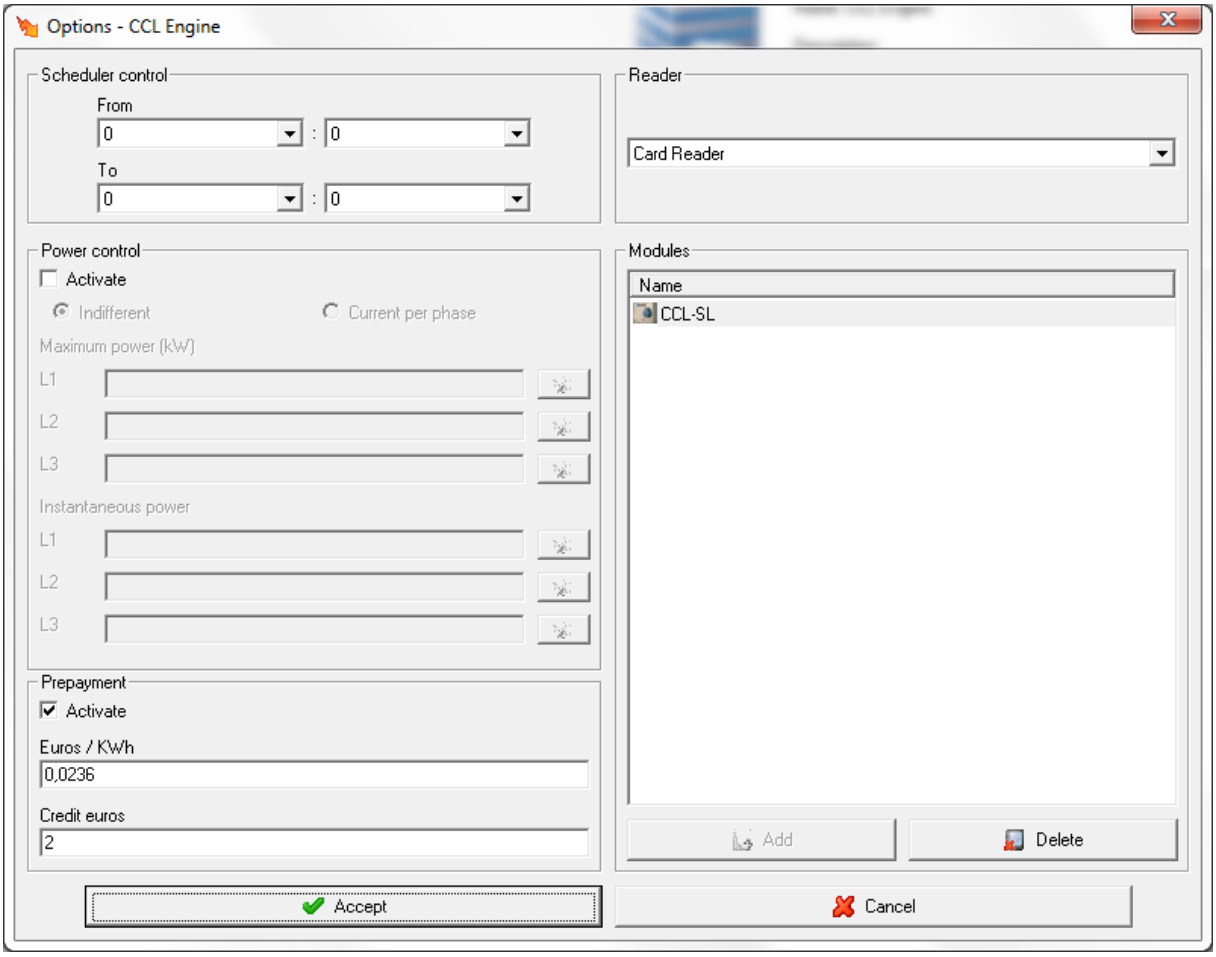
1.9.1 Driver options

Options menu:

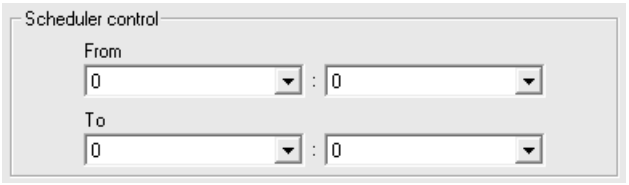


The *'Variable units'* option is detailed in section 1.1.2 Variable Units.

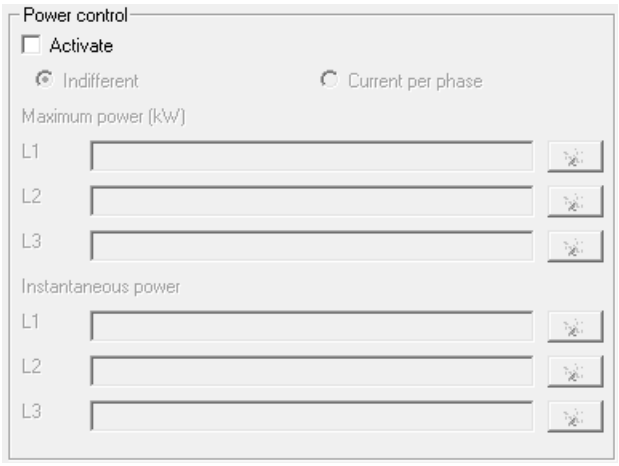
1.9.1.1 Device parameters



From this screen we can configure the parameters for the recharging that will be performed on the CCL equipment assigned to this CCLEngine.



The scheduler control allows you to determine the start and end time for recharging performed as programmed.

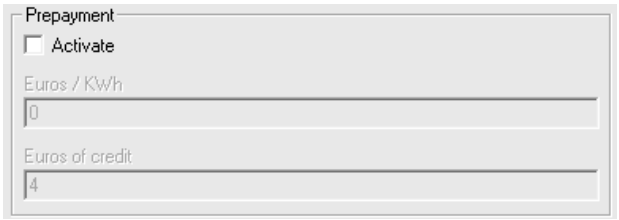


Allows you to activate/deactivate the power control.

The equation entered in "Maximum power" allows us to indicate the nominal maximum power of the installation to which the CCL devices are connected.

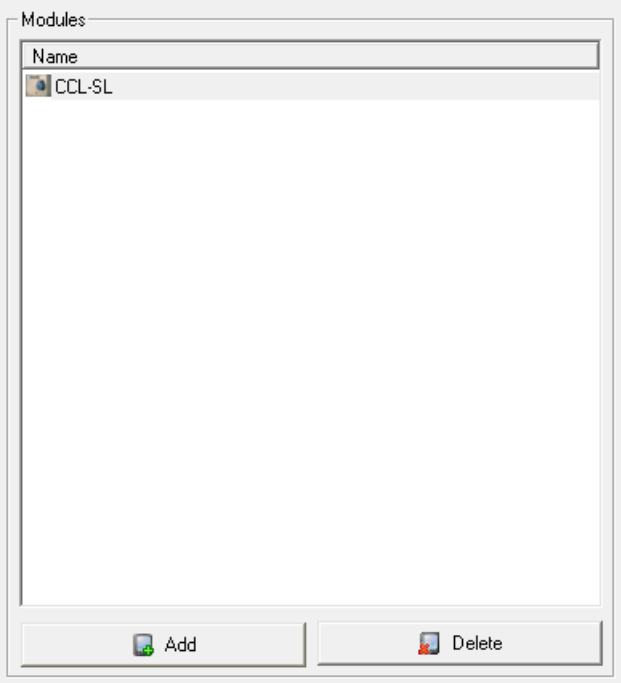
The equation entered into "Instantaneous power" allows us to indicate the method for determining the power being consumed at each moment in order to find out if we can connect another CCL device or not. In other words:

- The CCL devices have a nominal power
- In an installation with CCL devices, we can install equipment which indicates the power we are consuming at any time.
- In the case of activating the power control, before allowing the recharging of a new CCL, the CCLEngine will check whether the instantaneous power and the nominal power of the CCL which we are going to use exceed the maximum power. If this is the case, the CCL will wait to connect as soon as the instantaneous power consumption drops.



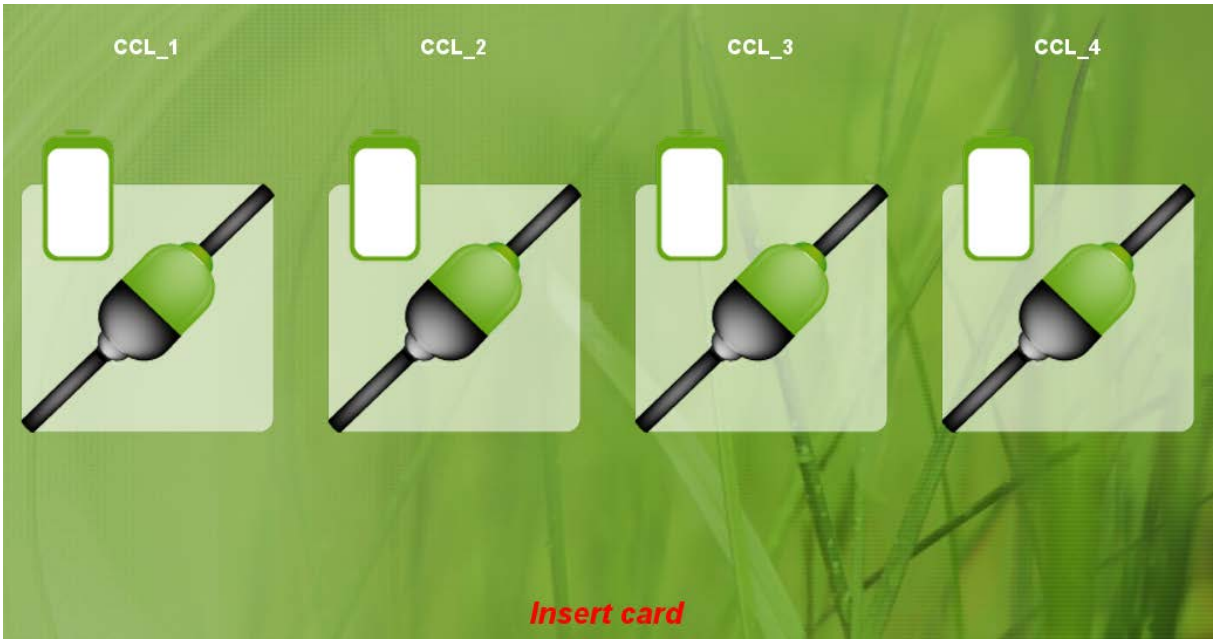
Allows you to activate the configuration of the cost per kWh and maximum amount that can be discharged in one recharge. This prevents a user's card from being emptied by mistake, by placing a limit on the discharge. As with the power control, management of the maximum discharge is optional.

This box can be used to assign the reader in which the cards should be entered to operate with the CCL devices assigned to this CCLEngine.

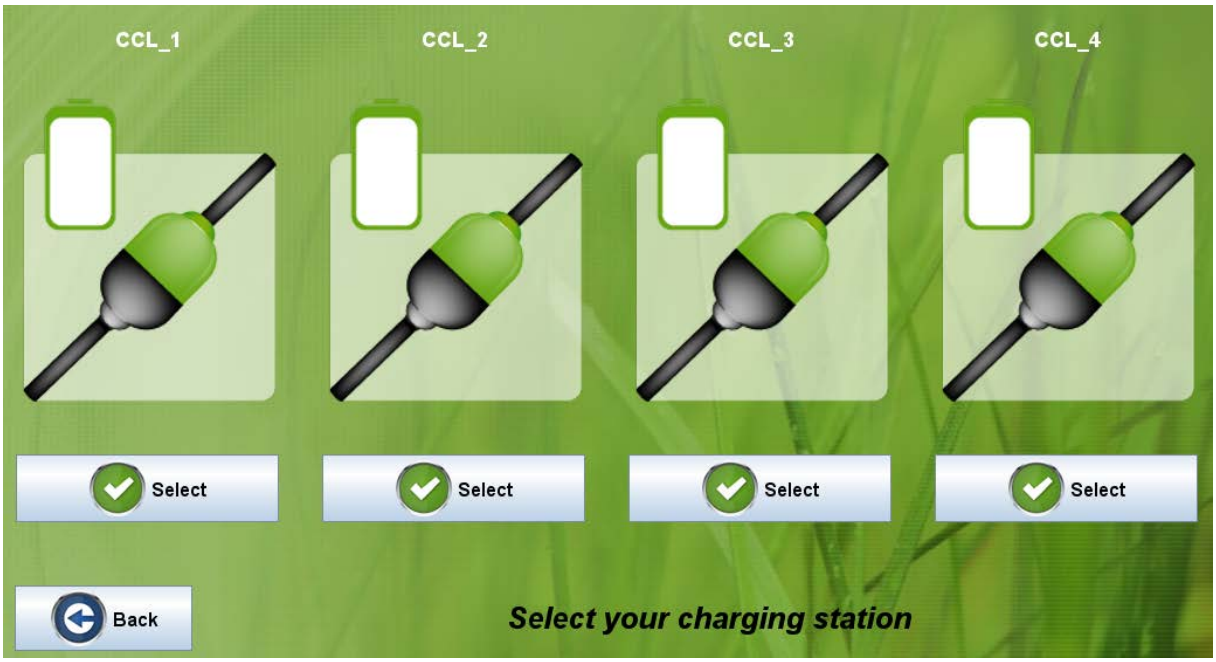


Allows you to enter the list of CCL recharge devices that this CCLEngine will manage.

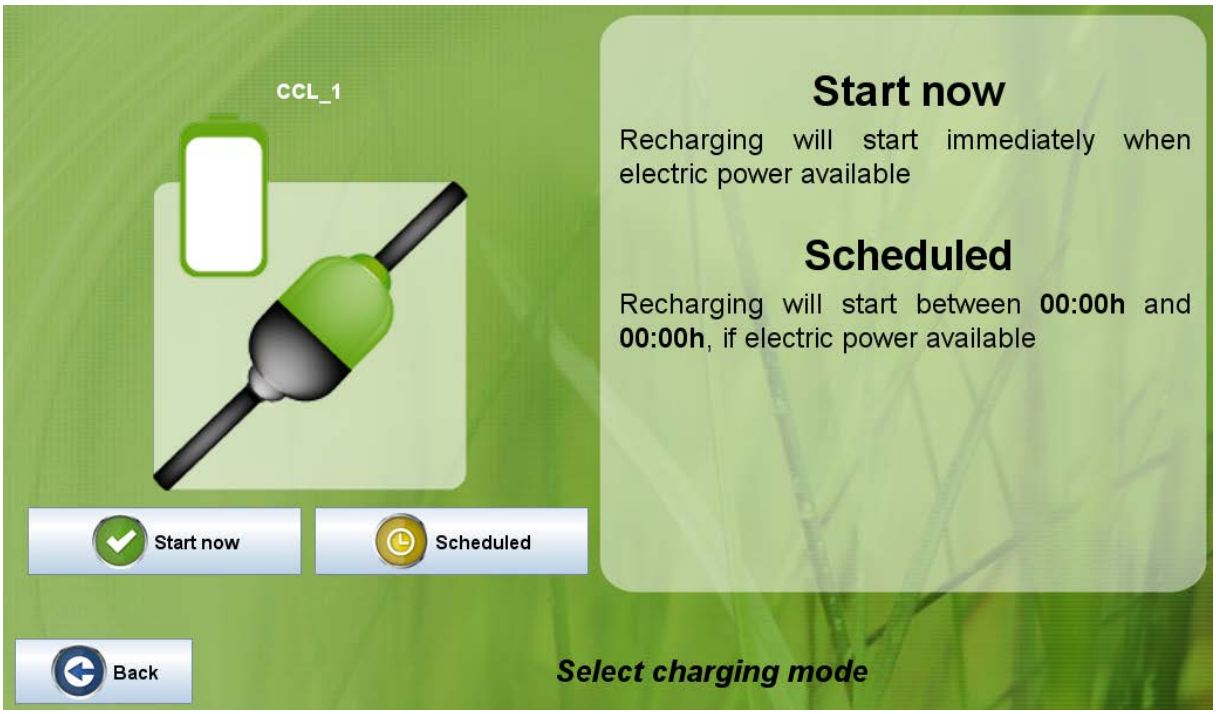
1.9.2 CCL Engine display



When we view the CCLEngine from the client, the CCLs which comprise this are displayed and we are able to enter a card in the reader, to program or end recharging.

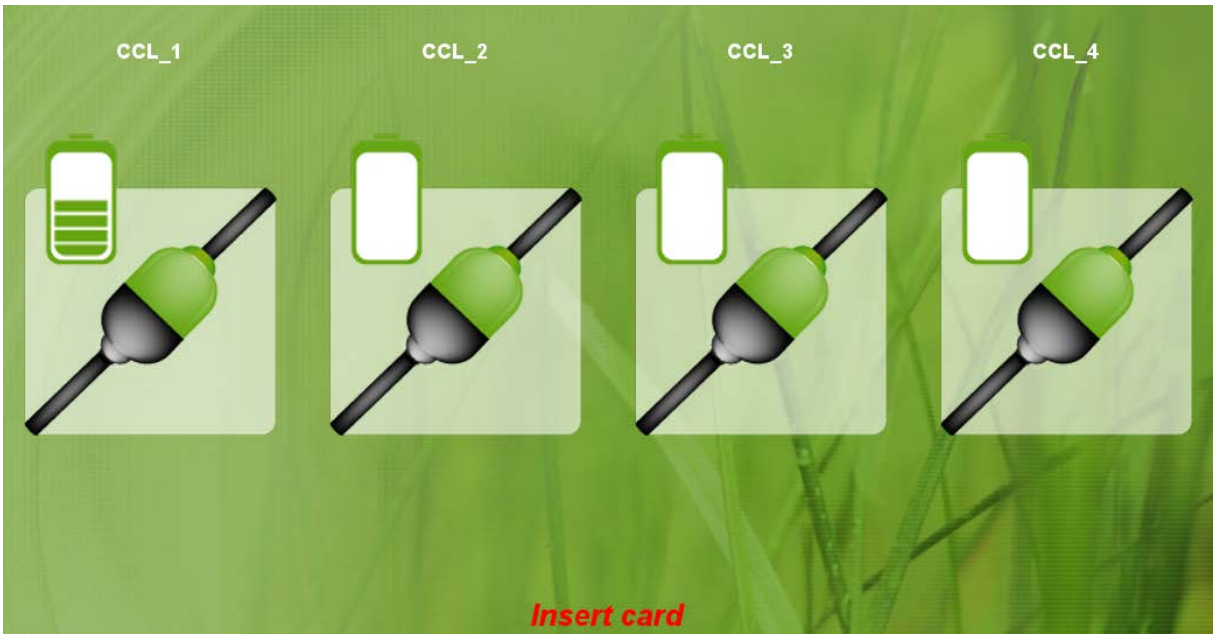


Once the card is entered, we are able to choose the CCL in which we would like to recharge,



and specify the type of recharging (immediate or scheduled).

While the card is inserted, the recharge parameters can be viewed, such as the date and start time, request date, recharge time, power and energy consumed.



When we remove the card, the CCLEngine returns to the home screen, indicating, if present, the CCL equipment that is recharging at that time.

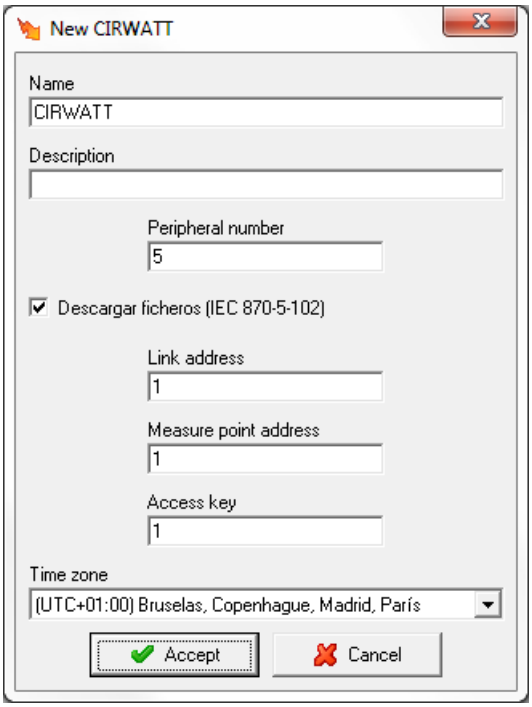
If we insert a card that has activated a recharge in this CCLEngine, the recharge properties screen will be displayed again:

we can use this to stop the recharge.

1.10.- CIRWATT

1.10.1 Download with protocol IEC 870-5-102

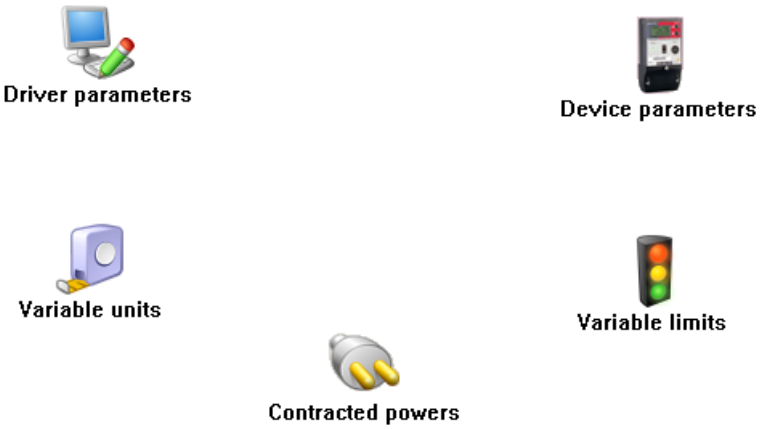
The CIRWATT device allows load curve and bill closures files to be downloaded through the IEC 870-5-102 protocol. To enable downloading when new equipment is added the "Download files (IEC 870-5-102)" option must be selected and the gateway, the measuring point address, and password configured.



From this screen it is possible to configure the time zone where the CIRWATT is located, by default the time zone of the software will appear but this should be modified if a new device is found in a different time zone.

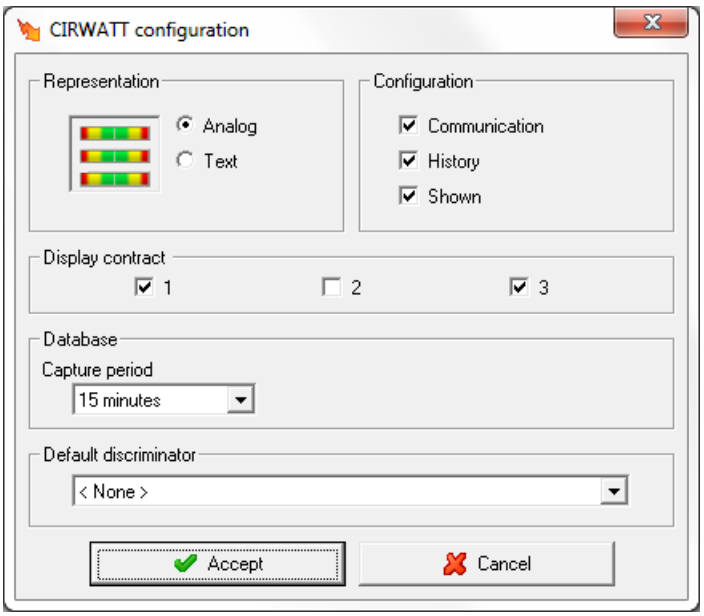
1.10.2 Driver options

Options menu:



The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.10.2.1 Driver parameters

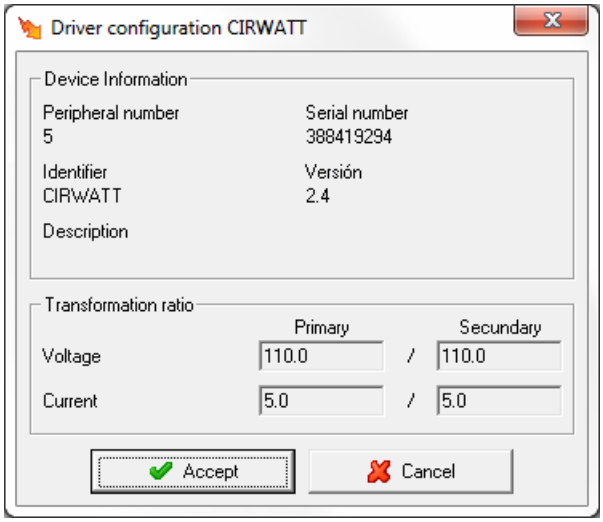


Allows the contracts to be displayed on screen to be selected. Using these selectors the contracts shown on screen can be selected. In this case the driver displays contracts 1 and 3, and will hide contract 2. These parameters will only affect the screen display of the CIRWATT device contracts but not the internal configuration of the CIRWATT device.

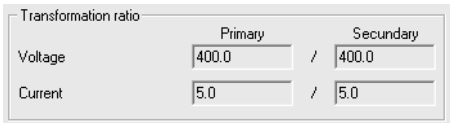
The remaining parameters are explained in section 1.1.1 Driver Parameters.

1.10.2.2 Device parameters

This screen will allow a series of internal information and device parameters to be displayed on screen.

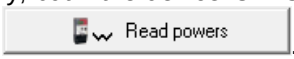


Displays general information.

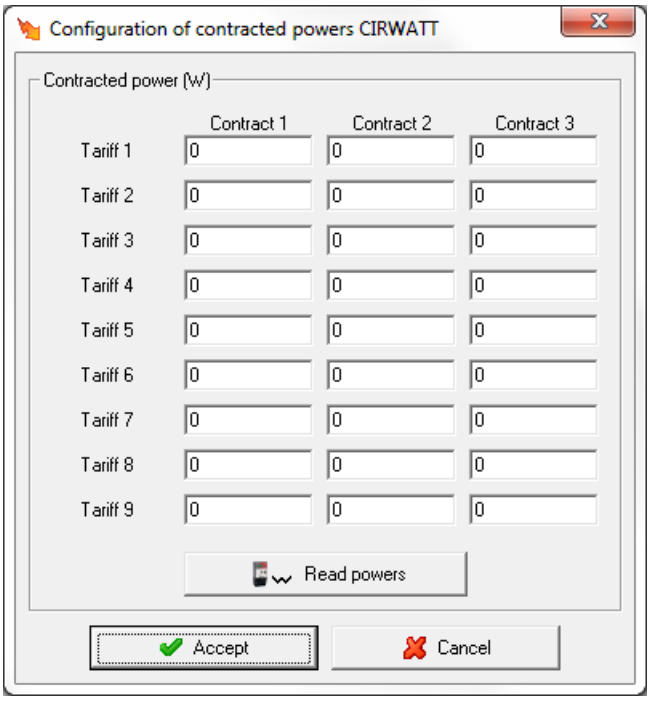


- **Voltage transformation ratio:** shows the ratio between primary and secondary voltage programd into the device.
- **Power transformation ratio:** Shows the ratio between the primary and secondary currents programd into the device.

1.10.2.3 Contracted power

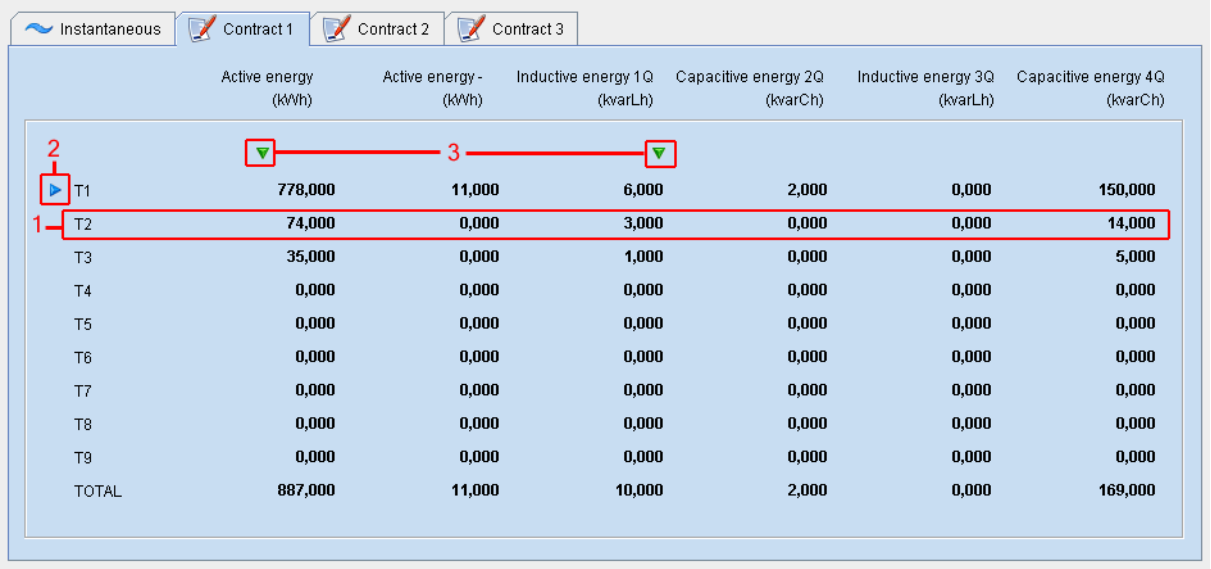
This screen allows the contracted loads for each contract and CIRWATT rate to be displayed. It is always be possible to enter contracted power manually, but if the device is IEC enabled it can also be read directly from the equipment by clicking the button 

.



1.10.3 Displaying Contracts

The CIRWATT device shows the following screen when viewing a contract:



	Active energy (kWh)	Active energy - (kWh)	Inductive energy 1Q (kvarLh)	Capacitive energy 2Q (kvarCh)	Inductive energy 3Q (kvarLh)	Capacitive energy 4Q (kvarCh)
T1	778,000	11,000	6,000	2,000	0,000	150,000
T2	74,000	0,000	3,000	0,000	0,000	14,000
T3	35,000	0,000	1,000	0,000	0,000	5,000
T4	0,000	0,000	0,000	0,000	0,000	0,000
T5	0,000	0,000	0,000	0,000	0,000	0,000
T6	0,000	0,000	0,000	0,000	0,000	0,000
T7	0,000	0,000	0,000	0,000	0,000	0,000
T8	0,000	0,000	0,000	0,000	0,000	0,000
T9	0,000	0,000	0,000	0,000	0,000	0,000
TOTAL	887,000	11,000	10,000	2,000	0,000	169,000

Where:

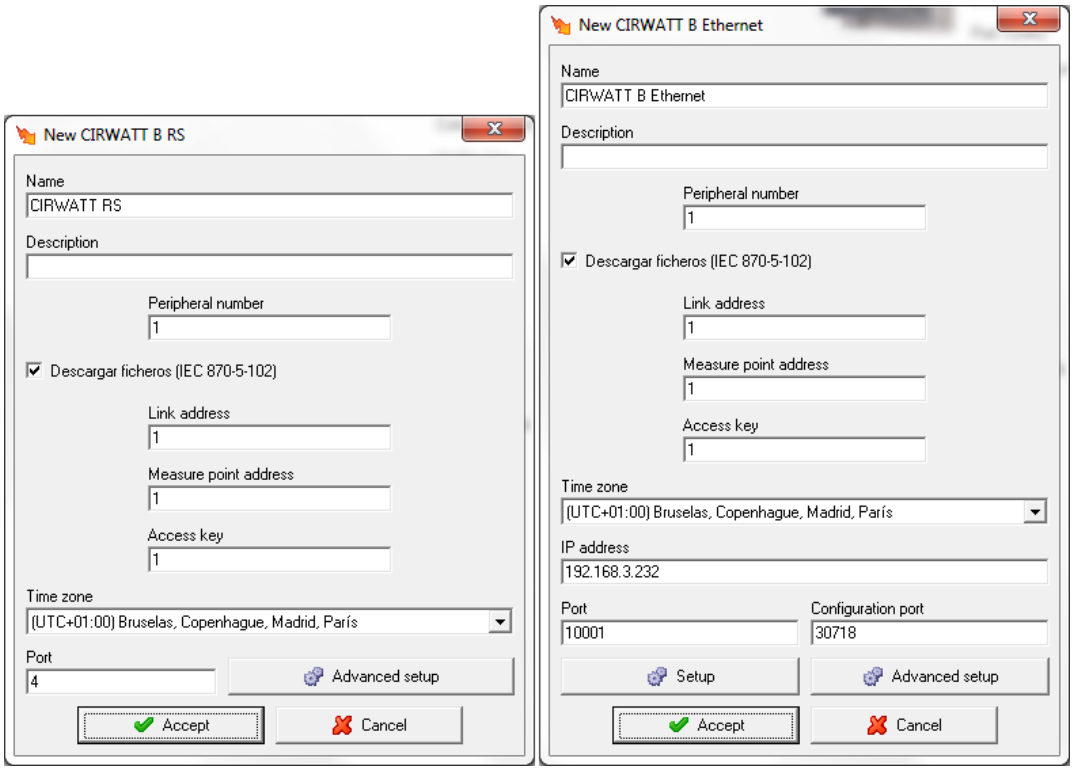
1. Corresponds to the information of a new contract rate.
2. Marks the active rate of the contract.
3. Marks the active quadrant.

Select the various tabs to display the desired contract. As indicated in section 1.9.2.1 Driver parameters, it is possible to select which contracts we want to view, and the tab corresponding to the hidden contracts will not appear. For example if you only want to view contracts 1 and 3 the tabs will be as follows:

1.11.- CIRWATT B

1.11.1 Download with protocol IEC 870-5-102

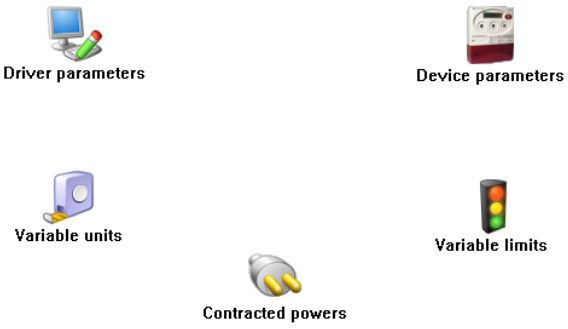
The CIRWATT B device allows load curve and bill closure files to be downloaded through the IEC 870-5-102 protocol. To enable downloading when new units are added the "Download files (IEC 870-5-102)" option must be selected and the communication, gateway address, measuring point address and access key parameters must be configured.



From this screen it is possible to configure the time zone where the CIRWATT is located, by default the time zone of the software will appear but this should be modified if a new device is found in a different time zone.

1.11.2 Driver options

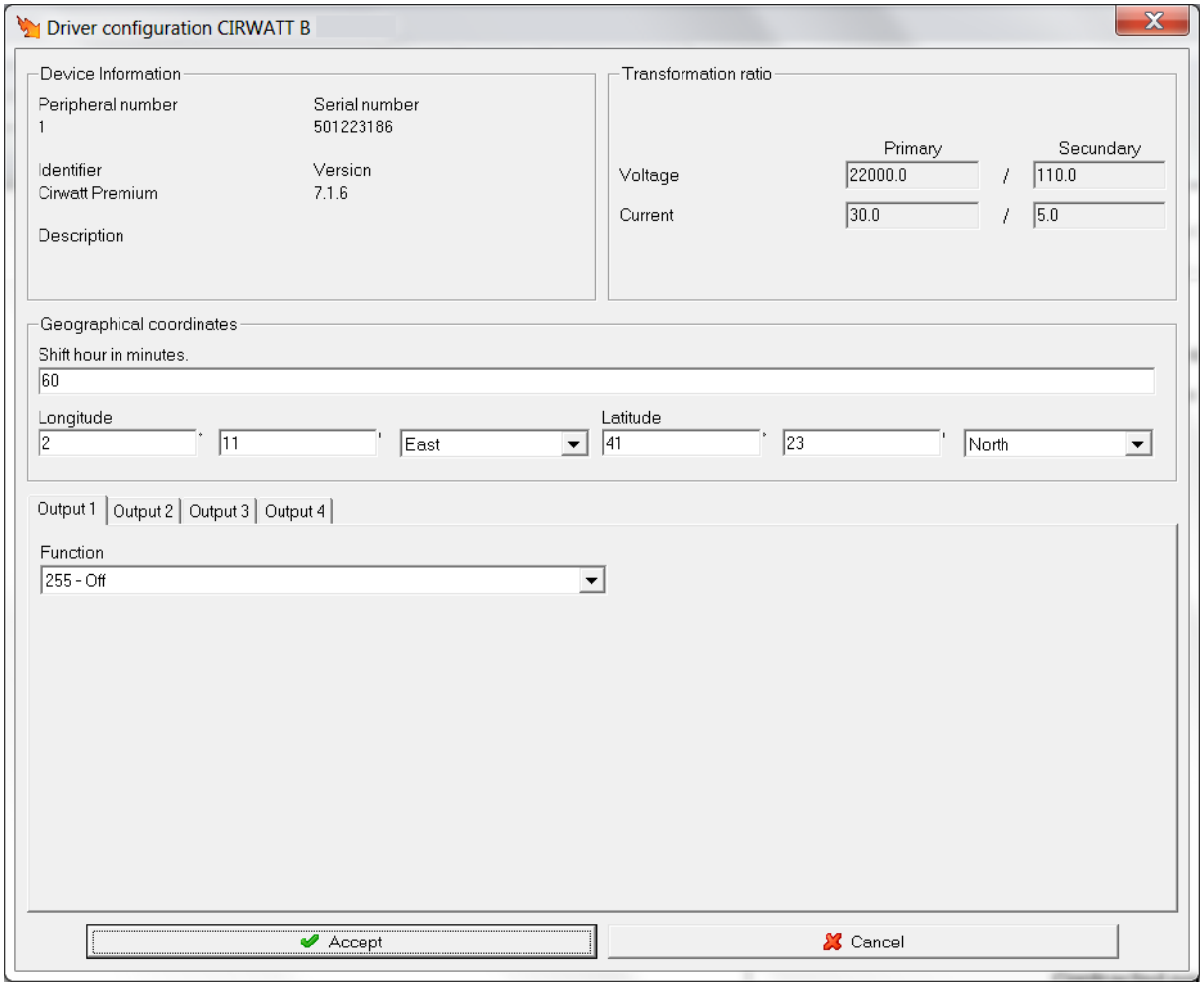
Options menu:

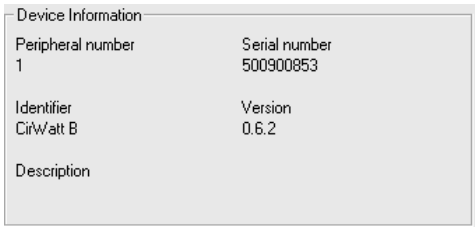


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

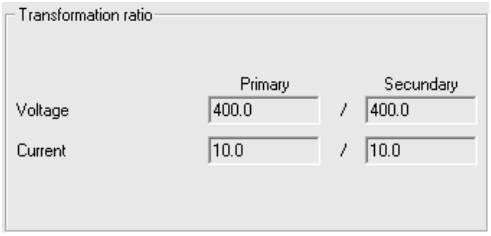
1.11.2.1 Device parameters

This screen will allow a series of internal information and device parameters to be displayed on screen.



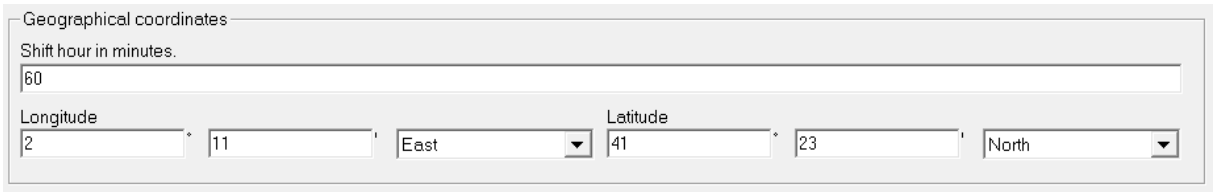


Displays general information.



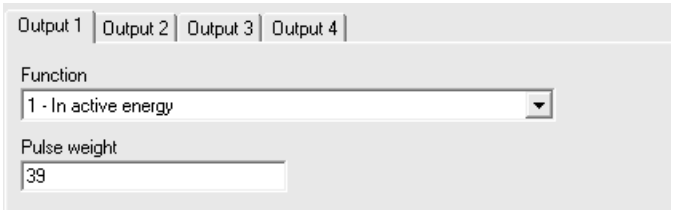
- **Voltage transformation ratio:** shows the ratio between primary and secondary voltage programmed into the device.

- **Power transformation ratio:** Shows the ratio between the primary and secondary currents programmed into the device.



Time zone where the device is located.

The configuration of the geographical coordinates will only appear when the device has the astronomical clock option.



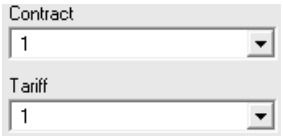
The digital output configuration will only appear when the device has digital outputs. The number of digital outputs will depend on the device model.

Depending on the function, it will be possible to configure additional parameters associated with the function selected.

- **Function 1**: Incoming active energy.
- **Function 2**: Outgoing active energy.
- **Function 3**: Reactive energy Q1/Q2.
- **Function 4**: Reactive energy Q3/Q4.

Value between 0.1 and 65535 with one decimal.

- **Function 5**: Maximeter.
  Function without additional parameters.
- **Function 6**: RM in tariff period.

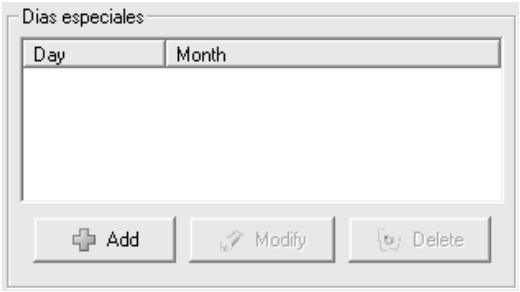


Contract: Value between 1 and 3.

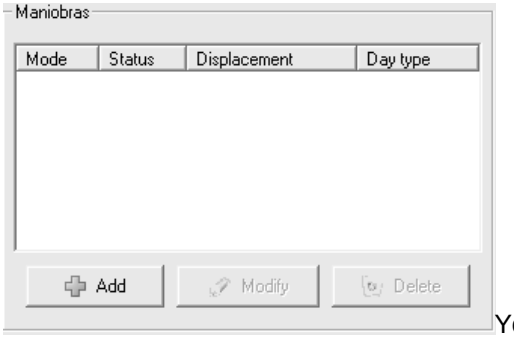
Tariff: Value between 1 and 9.

- **Function 106**: Astronomical.

  This function can only be configured in equipment with an astronomical clock.



You will be able to configure a maximum of seven special days.



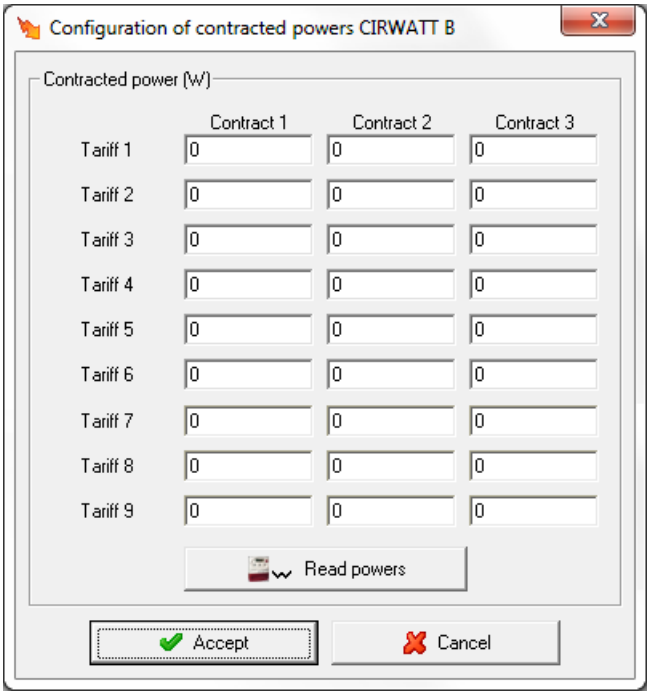
You will be able to define a maximum of eight operations.

- **Function 255**: Deactivated.

1.11.2.2 Contracted power

This screen displays the contracted powers. You will always be able to enter the contracted powers manually and read them directly from the equipment by pressing the

button.



1.11.3 Digital inputs

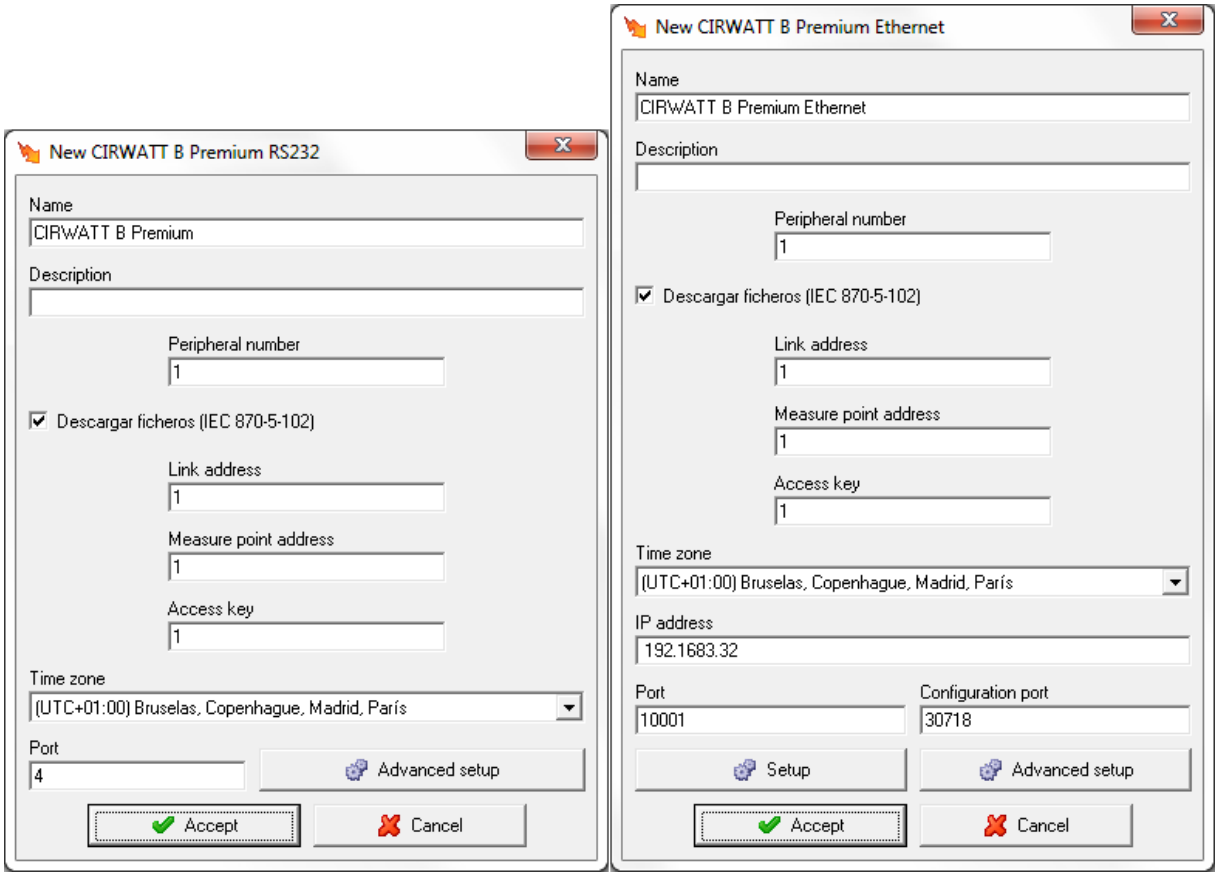
Some Cirwatt B devices have a built-in digital input card. It will check whether the external inputs are open or closed and count the number of times they are opened and closed.

Refer to the unit's manual to check whether your unit has built-in digital inputs or not. The unit's firmware version must be 01.00.05 or later. Otherwise, the units with digital inputs and earlier firmware versions will not communicate.
In addition, the variables that count the number of times that digital inputs close cannot be reset to 0.

1.12.- CIRWATT B PREMIUM

1.12.1 Download with protocol IEC 870-5-102

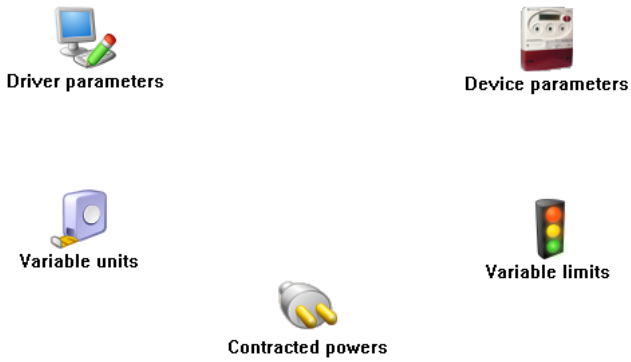
The CIRWATT B Premium device allows load curve and bill closure files to be downloaded through the IEC 870-5-102 protocol. To enable downloading when a new unit is added, the "Download files (IEC 870-5-102)" option must be selected and the gateway, the measuring point address, and access key parameters must be configured.



From this screen it is possible to configure the time zone where the CIRWATT is located, by default the time zone of the software will appear but this should be modified if a new device is found in a different time zone.

1.12.2 Driver options

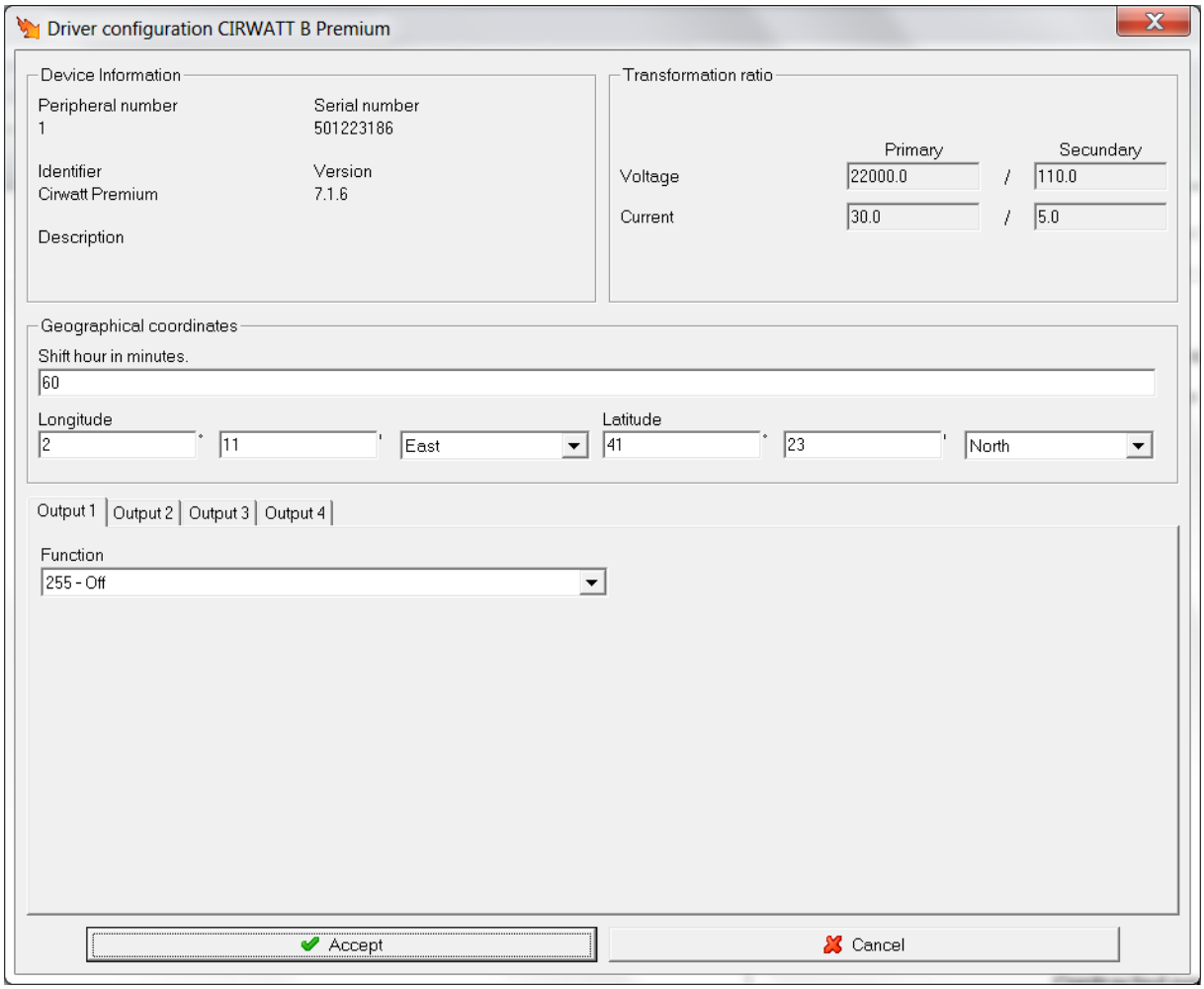
Options menu:

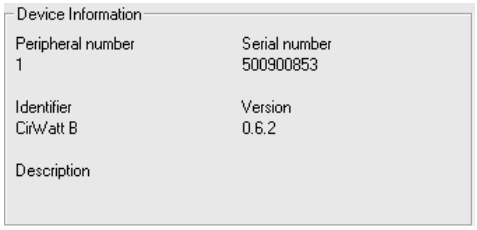


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Unidades de las variables and 1.1.3 Límites de las variables, respectively.

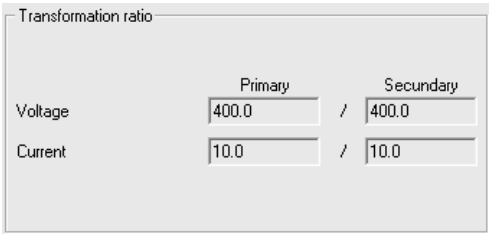
1.12.2.1 Device parameters

This screen will display internal device information and parameters on the screen.



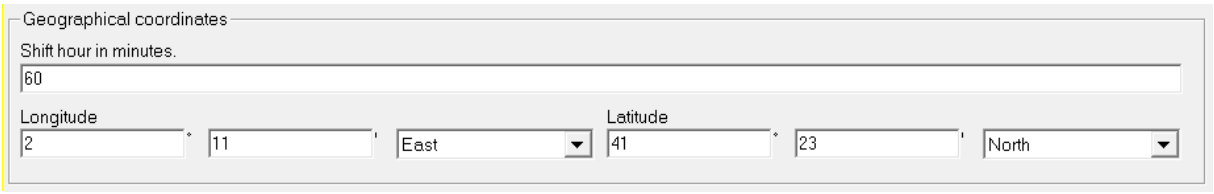


Displays general information.



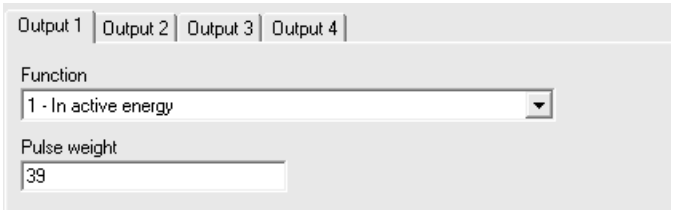
- **Voltage transformation ratio:** Shows the primary to secondary voltage ratio programmed in the device.

- **Power transformation ratio:** Shows the primary to secondary current ratio programmed in the device.



Time zone where the device is located.

The configuration of the geographical coordinates will only appear when the device has the astronomical clock option.



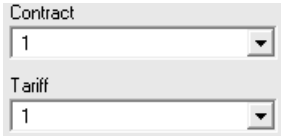
The digital output configuration will only appear when the device has digital outputs. The number of digital outputs will depend on the device model.

Additional parameters associated to the selected function can be configured, depending on the function:

- **Function 1**: Incoming active energy.
- **Function 2**: Outgoing active energy.
- **Function 3**: Reactive energy Q1/Q2.
- **Function 4**: Reactive energy Q3/Q4.
-

Value between 0.1 and 65535 with one decimal.

- **Function 5**: Maximeter.
  Function without additional parameters.
- **Function 6**: RM in tariff period.
-



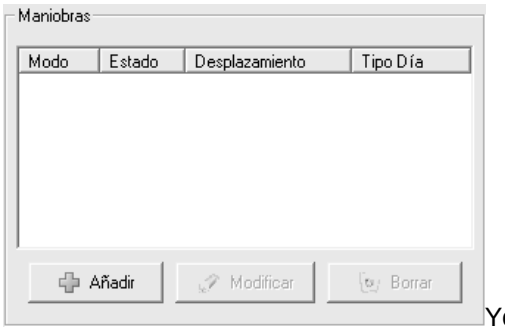
Contract: Value between 1 and 3.

Tariff: Value between 1 and 9.

- **Function 106**: Astronomical.

  This function can only be configured in units with an astronomical clock.

You will be able to configure a maximum of seven special days.



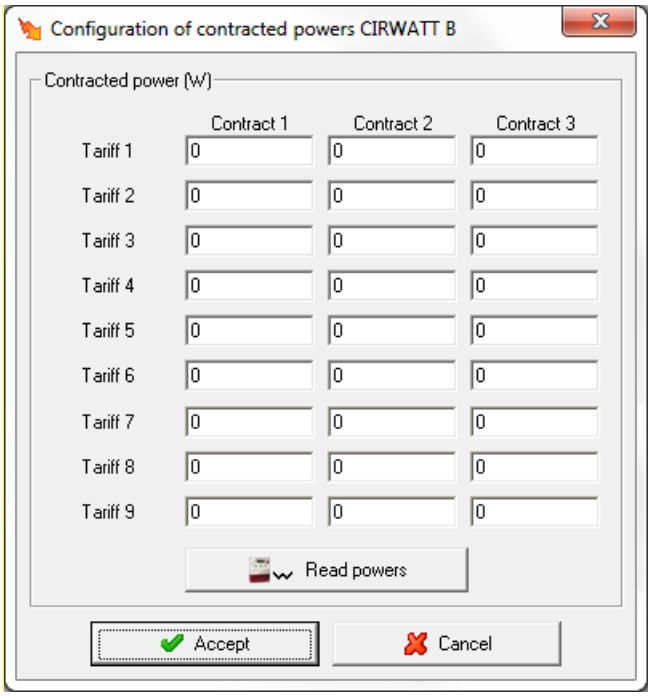
You will be able to define a maximum of eight operations.

- **Function 255**: Deactivated.

1.12.2.2 Contracted power

This screen displays the contracted powers. You will always be able to enter the contracted powers manually and read them directly from the unit by pressing the

button.



1.12.3 Digital inputs

Some Cirwatt B's have a built-in digital input card. It will check whether the external inputs are open or closed and count the number of times they are opened and closed.

Refer to the unit's manual to check whether your unit has built-in digital inputs or not. The unit's firmware version must be 01.00.05 or later. Otherwise, the units with digital inputs and earlier firmware versions will not communicate.
In addition, the variables that count the number of times that digital inputs close cannot be reset to 0.

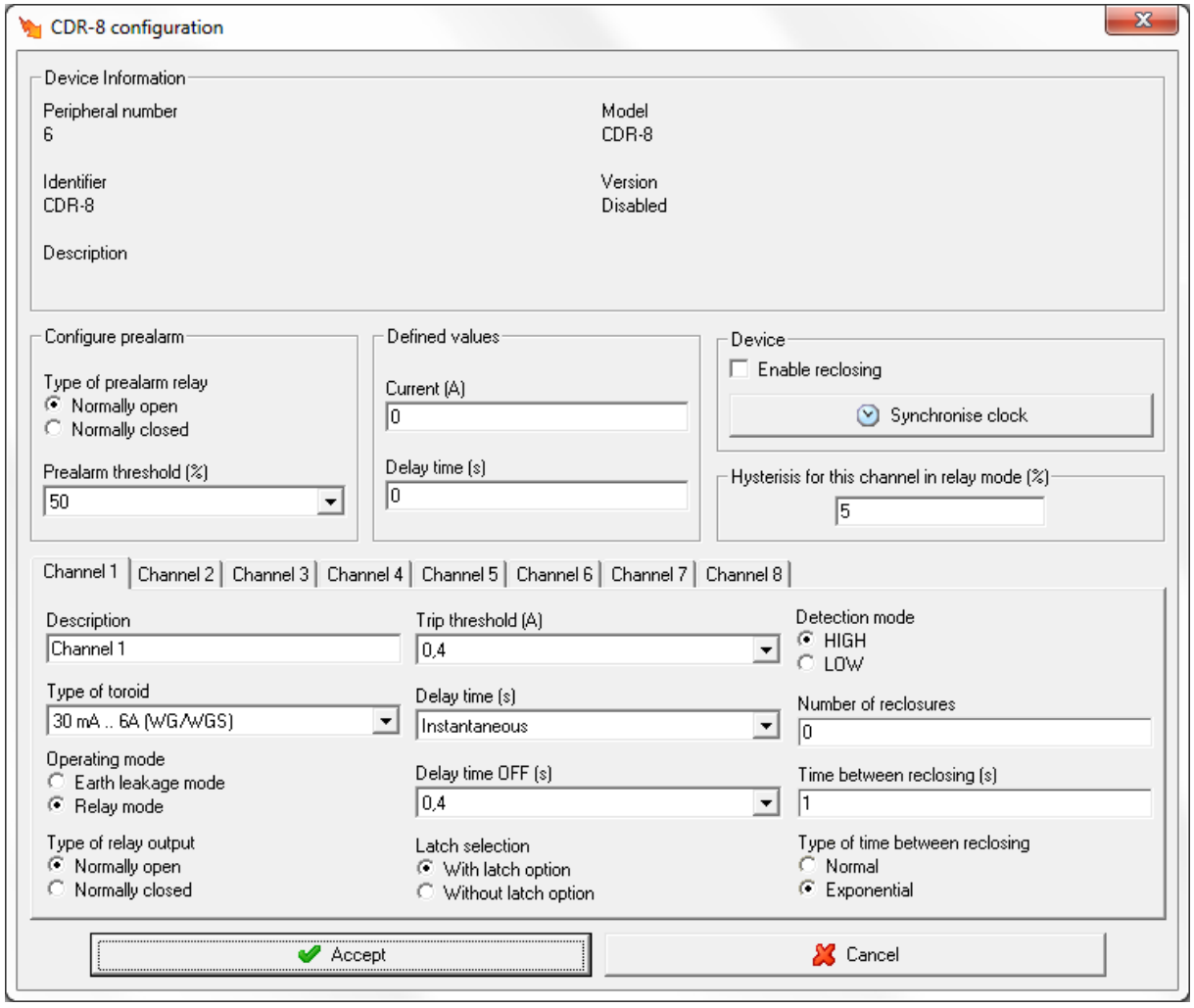
1.13.- CDR-8

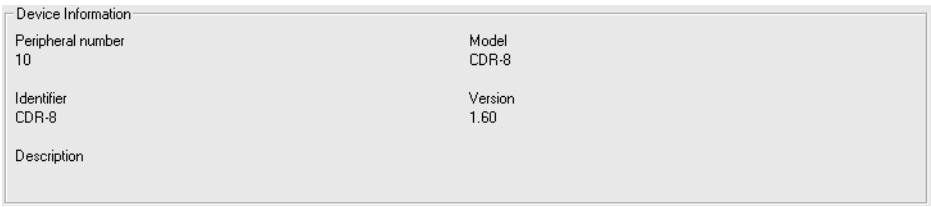
1.13.1 Driver options

Options menu:

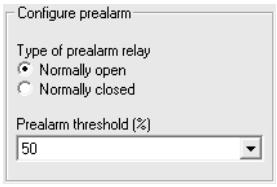
1.13.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "*Accept*" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.



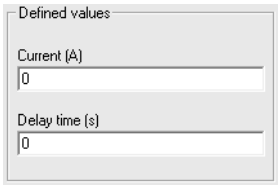


Shows general information.



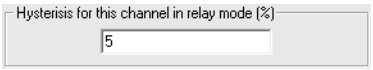
The following can be configured:

- *Type of pre-alarm relay.* Operation method of the pre-alarm relay common to all channels of the device.
- *Pre-alarm threshold.* Pre-alarm threshold the equipment possesses. This can vary between 50 and 100% of the minimum trigger threshold of the device channels.

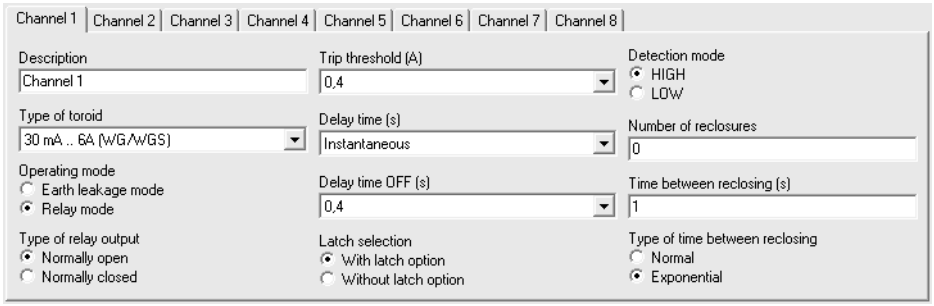


A trigger threshold and a user-personalized delay time can be configured by the user. These parameters are common to all channels of the device. Depending on the type of channel selected, the customized threshold may be selected or not.

This selector allows the equipment to have the channel reconnections enabled or not. Depending on whether the reconnections are enabled or not, some of the channel configuration fields will be enabled or disabled. Clicking on the '*Synchronize clock*' button the present PC time will be sent to the device.



% Of hysteresis for the connection and disconnection of the channel configured in the relay mode.



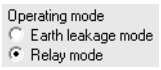
Shows the channel configuration.

As it is only possible to display the configuration of one channel at a time, click on one of the channels to display the corresponding configuration.

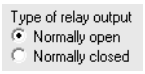
Alphanumeric type information where a brief description of the channel can be entered for easy identification.

Toroid type connected to the channel. There are three possible selection options:

- Channel disabled
- Fullscale channel of 6A (30mA .. 6A)
- Fullscale channel of 60A (300mA .. 60A)



Channel operating mode. Depending on the selected mode, some of the configuration options of the channel may be disabled.



Channel output relay operating mode.

Channel triggering threshold, depending on the type of toroid connected the available values will be:

Toroid 30 mA...6A		Toroid 300 mA 60A ...	
30 mA	1 A	300 mA	10 A
50 mA	1.5 A	500 mA	15 A
100 mA	2 A	1 A	20 A
200 mA	2.5 A	2 A	25 A
300 mA	3 A	3 A	30 A
400 mA	3.5 A	4 A	35 A
500 mA	4 A	5 A	40 A
600 mA	4.5 A	6 A	45 A
700 mA	5 A	7 A	50 A
800 mA	5.5 A	8 A	55 A
900 mA	6 A	9 A	60 A
Customized [1]		Customized	

[1] Only if the value of the customized trigger threshold does not exceed 6A

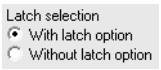
Channel delay time, depending on the selected operating mode, the possible values are:

Instantaneous:	Selective	0.1 s
0.4 s	0.8 s	1 s
3 s	5 s	10 s
60 s [1]	Customized	

[1] Only if the channel works on the relay mode

Delay time in the channel reset when working on the relay mode, the possible values are:

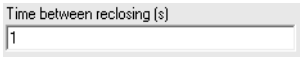
0.1 s	0.4 s	0.8 s
1 s	3 s	5 s
10 s	60 s	Customized



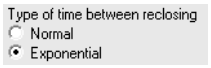
Channel lock selection when working on the relay mode.

Triggering selection; low current (LOW) or overcurrent (HIGH) of the channel when working in relay mode.

Number of attempts at reconnection. After this number the relay will be locked.



Time interconnections.

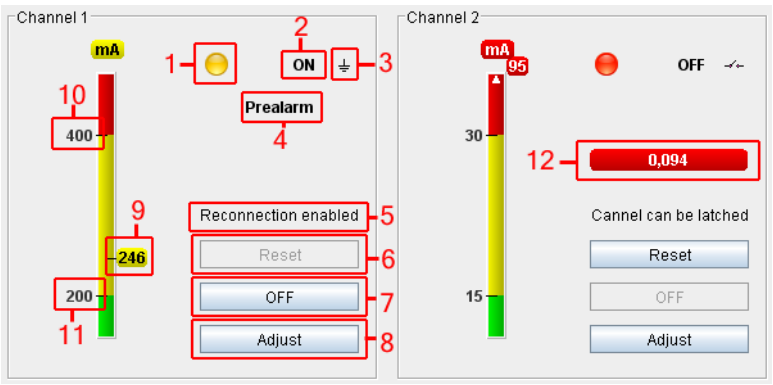


Operating mode in the time interconnections.

1.13.2 Displaying values

The CDR-8 device will display the following screen values:

Where:



1. Channel status:

   - Status ON.
   - Pre-alarm status.
   - Status OFF.

2. Relay status:

   - ON. Unlocked channel.
   - OFF. Locked channel.

3. Channel operating mode:

   - Differential mode.
   - Relay mode.

4. Additional information on the status of the channel:

   - *Pre-alarm*: Pre-alarm enabled.
   - *Reconnection:* Channel disconnected with timed reconnection process.
   - *Remote:* Channel disconnected by external triggering, cannot be automatically reconnected.

5. Additional channel information:

   - *Reconnection enabled:* Reports that channel reconnections have been enabled. Only if the channel is in differential mode.
   - *Channel can be locked.* Reports that the channel will remain locked when trigged, with manual or remote reset being necessary. Only if the channel is in relay mode.

6. Reset button. If the channel is triggered, the button will remain disabled. Push the button to restart the channel.

7. OFF button. External disconnection of the channel. The button will remain disabled if the channel has not been triggered.

8. Adjustment button. Enables programming of sensitivity and channel delay. Channel information is also shown.

9. Channel instantaneous differential current value. When the channel Instantaneous differential current value exceeds the limits of the value bar, either in excess or default, this will be indicated as shown in the figure (arrow below the value).

10. Channel trip threshold value configured.

11. Channel pre-alarm value configured.

12. Differential current value detected when the channel triggers.

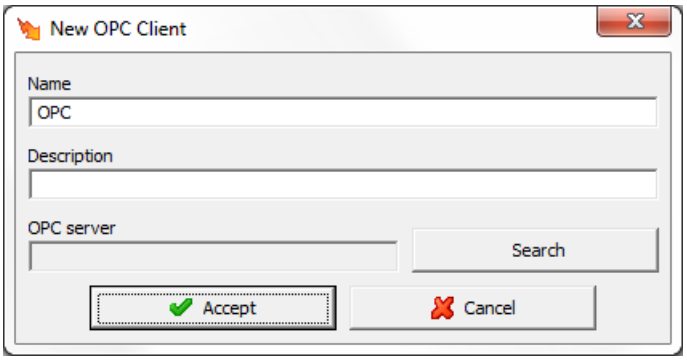
1.14.- Client OPC[2]

This PowerStudio driver allows a OPC-DA client to be configured to access the variables accessible on a OPC-DA server.

Once the variables to be read have been configured, the OPC client will behave in a manner similar to other devices with which the program communicates.

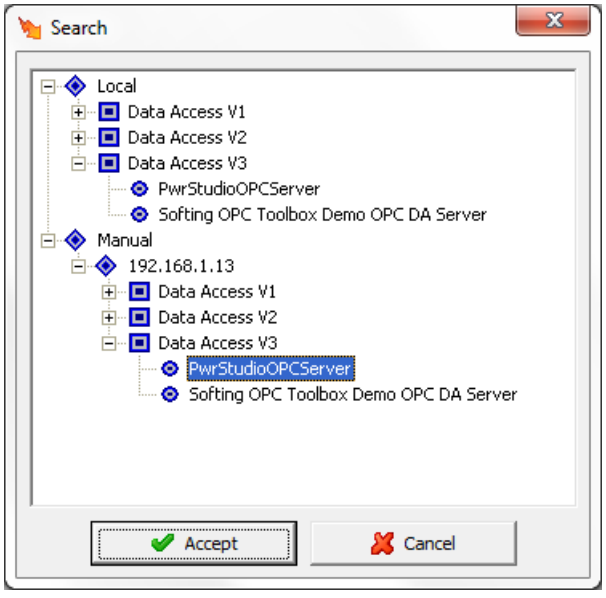
1.14.1 OPC connection configuration

To add a new OPC client the OPC server to which it has access must be indicated.



Pressing button

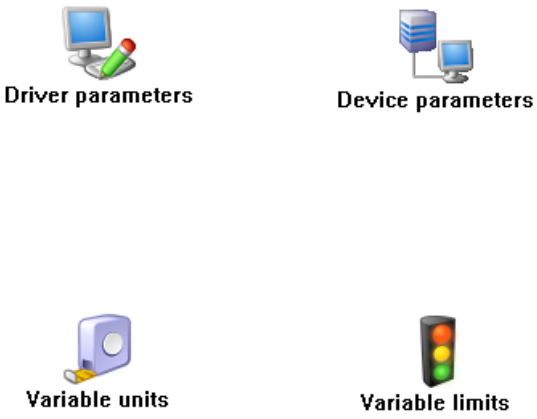
brings up a dialogue to conveniently select the OPC server. We may select a local server that has previously been configured on our machine, or enter the IP address of a machine on the local network to seek all the OPC servers that it may have configured. The OPC specifications supported by the client are “Data Access V1”, “Data Access V2” and “Data Access V3”.



[2] Only in Deluxe version

1.14.2 Driver options

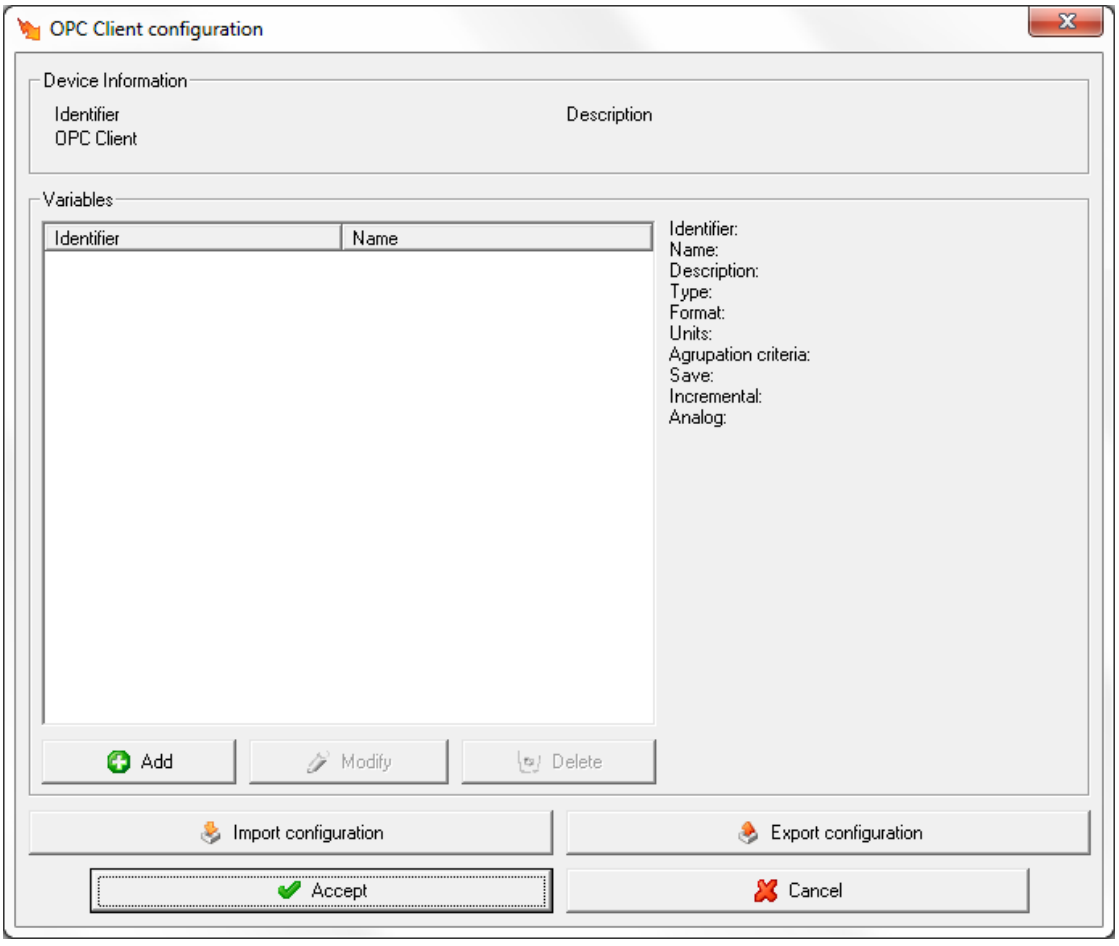
Options menu:



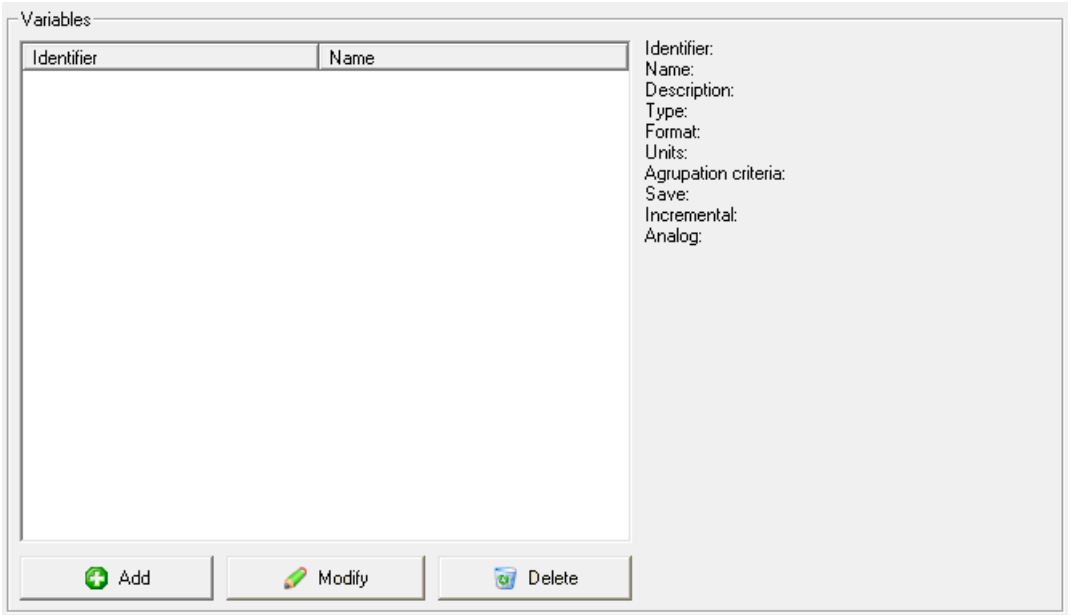
The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.14.2.1 Device parameters

This screen is used to configure the variables that should be requested from the OPC server.



General OPC client information.



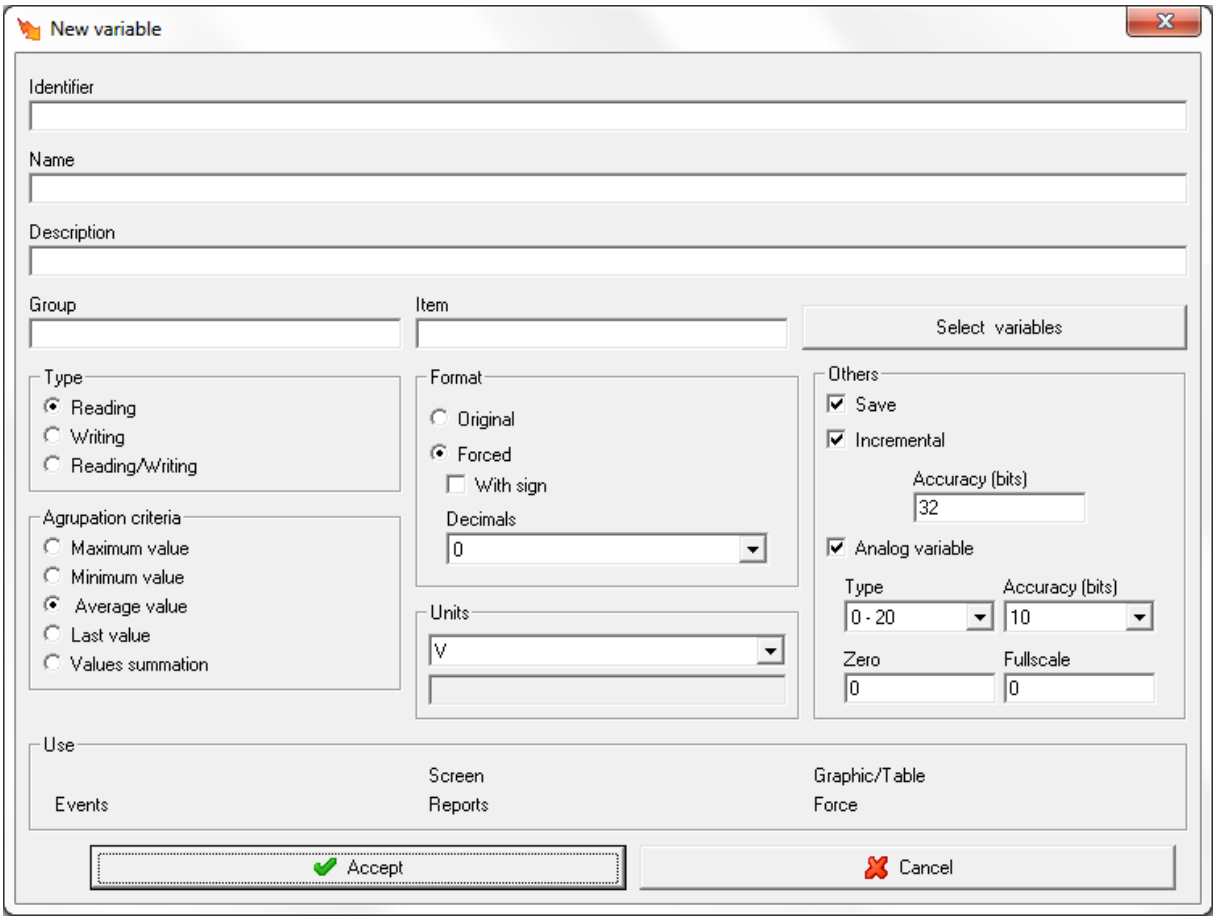
OPC client variable Configuration. See 1.14.2.1.1 Numeric variables.

Allows loading of a variable configuration that was previously saved to disk. This option is useful when the same variables have to be configured on several OPC clients.

Allows the variable configuration to be saved to disk, so that it can subsequently be loaded on another OPC client.

1.14.2.1.1 Variables

Pushing the “Add" or “Modify” button brings up a dialogue to configure the variable.

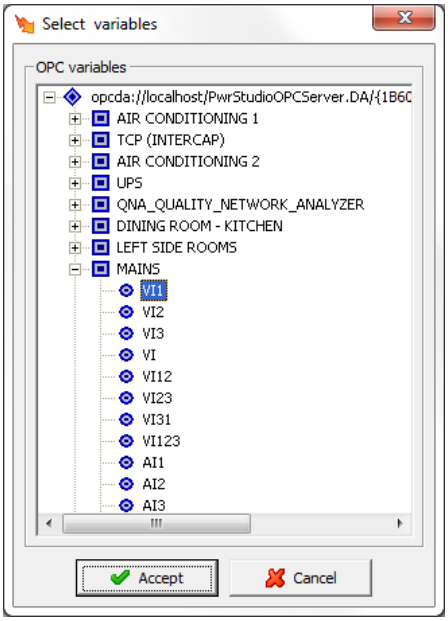


- **Identifier:** Allows each of the binary variables to be used in expressions and conditions to be identified, see 'Editor Manual'.
- **Name:** Variable name, used to better identify it.
- **Description:** Short description of the variable.
- **Group:** Identifier of the group the variable belongs to in the OPC server.
- **Item:** Identifier of the item the variable belongs to in the OPC server.
- **Others:** Different variable configuration parameters:
    - **Save:** Indicates whether or not the server value read should be saved in the value log.
    - **Incremental:** Indicates whether the value of the variable displayed is incremental. Typical energy variable option to see increments.
    - **Analogue variable:** Indicates whether or not the variable to be read is analogue type.
    - **Zero:** Value of the parameter to which the zero of the scale is assigned.
    - **Fullscale:** Value of the parameter to which the maximum value of the scale is assigned.
    - **Type:** Type of output, allows between 0-20 mA, 4-20 mA or 0 -? V, depending on the device.
- **Accuracy:** Number of bits in the sample.

- **Format:** Variable data format indicated.
    - Original: Based on how the variable is configured on the OPC server one conversion or another will be made.
        - VT_R4 handled as floating type value.
        - VT_UI4 handled as integer value with no symbol.
        - VT_R8 handled as double type value.
        - Any other type will display the value converted into a string.
    - Forced: Indicate whether or not the variable has a symbol and the number of decimals.
- **Type:** Selects the type of variable; i.e., read, write or both. If the variable is write or read/write the value can be forced on the device.
- **Grouping criteria:** Enables the variable values grouping criteria to be selected in graphs, tables, reports and the value to be saved in the values register. For example, if in the period between saving information we have 3 values (10, 12 and 7) these will be saved in the log register.
    - Maximum value. The maximum value of 3 (12) will be saved
    - Minimum value: The minimum value of 3 (7) will be saved.
    - Average value: The average value of 3 ((10 + 12 + 7) / 3 = 9.66) will be saved.
    - Last value: The last value will be saved (7).
    - Sum of the values: The last value will be saved (7).

  In the case of clusters of values in graphs, tables and reports the same criteria will be followed, except when it is the summation of values, where the sum of 3 values is shown (10 + 12 + 7 = 29).
- **Units:** Units in which the value is expressed. You can select one of the predefined units or define a new user unit.
- **Use:** Shows where the variable may be used in the rest of the program.
- **Select variables:** Pressing the

button brings up the variables selection dialogue of the previously configured OPC server, and all the groups and items that can be accessed from it are displayed.



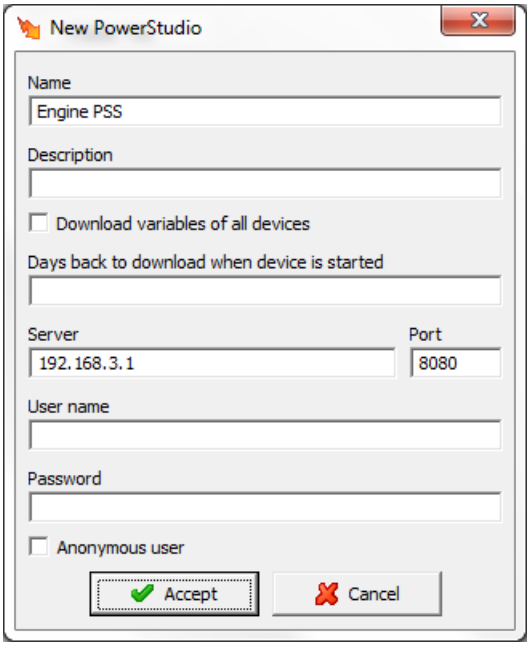
1.15.- CLIENT POWERSTUDIO[3]

The PowerStudio client driver allows PowerStudio devices and variables to be accessed when running on a remote machine.

Once the variables to be read have been configured, the PowerStudio client will behave in a manner similar to other devices with which the program communicates.

1.15.1 PowerStudio client device configuration

Use the devices menu to add a new PowerStudio client as a first level device.



As shown in the previous dialogue, the address and port of the remote PowerStudio server to which we want to connect must be indicated, and also the user and password if authentication is enabled.

The 'Download variables from all the machines' option may be chosen, in which case all machines and variables accessible in remote PowerStudio will automatically be downloaded. If this option is not set, each variable must be added manually.

The 'Download dates previous to the current date when the device is started' option will show the number of days before the current date for which the files will be downloaded since communications are established with the unit for the first time.

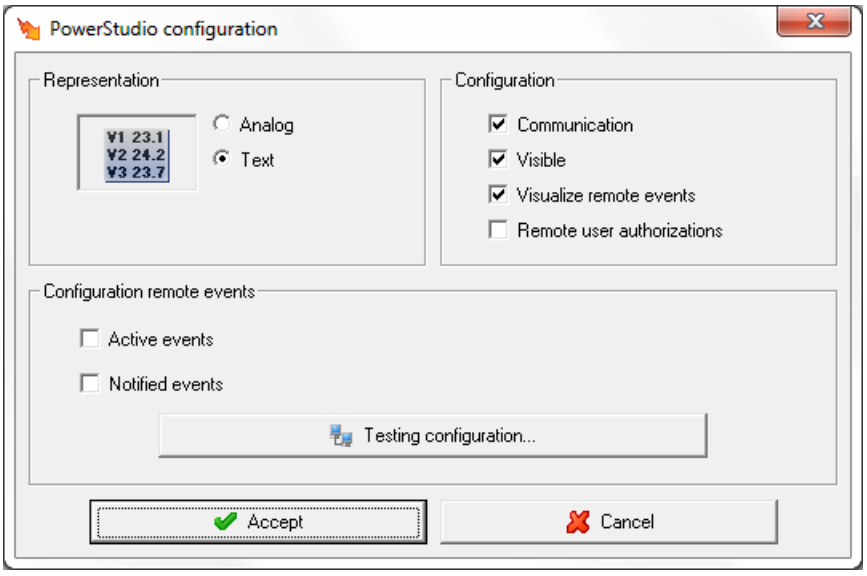
[3] Only in Deluxe version

1.15.2 Driver options

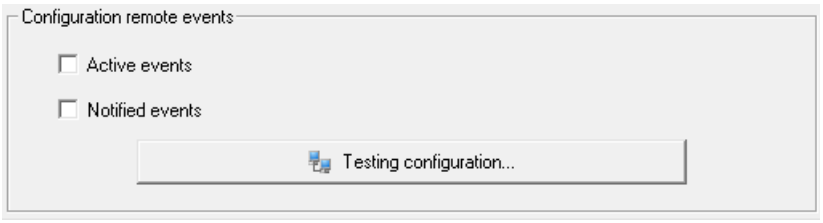
Options menu:

The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.15.2.1 Driver Parameters



Allows the display of remote events in the client to be activated.

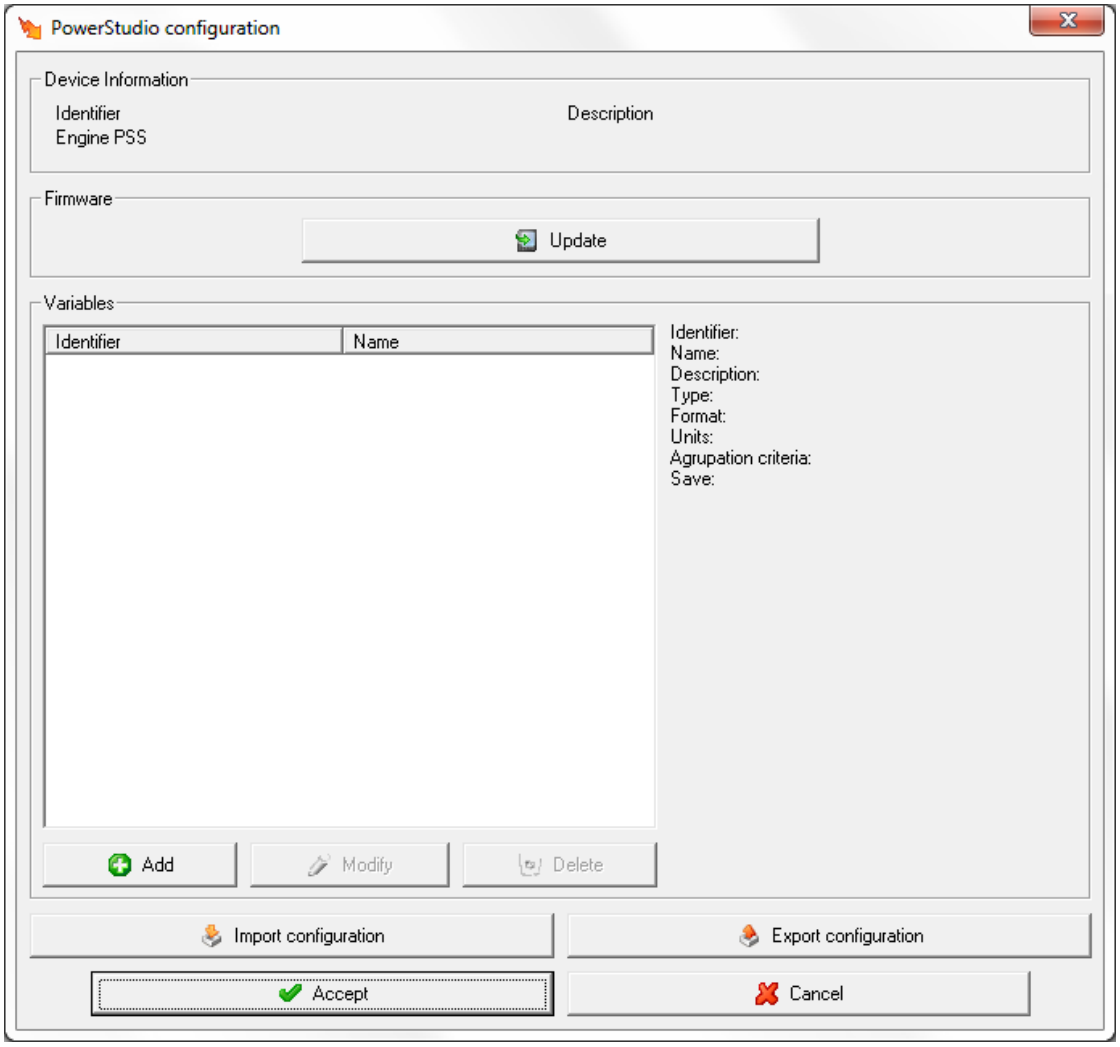


On activating the display of remote events the configuration of remote events will be enabled; here you can activate the types of events you want to receive and you can test communication with the remote equipment. These events can be displayed in the client in the same way as local events.

The remaining screen parameters are detailed in section 1.1.1 Driver parameters.

1.15.2.2 Device parameters

This screen is used to configure the variables that should be requested from the remote PowerStudio.



General PowerStudio client information.

The unit's firmware version can be manually updated by selecting the file with the '*upgrade*' extension.

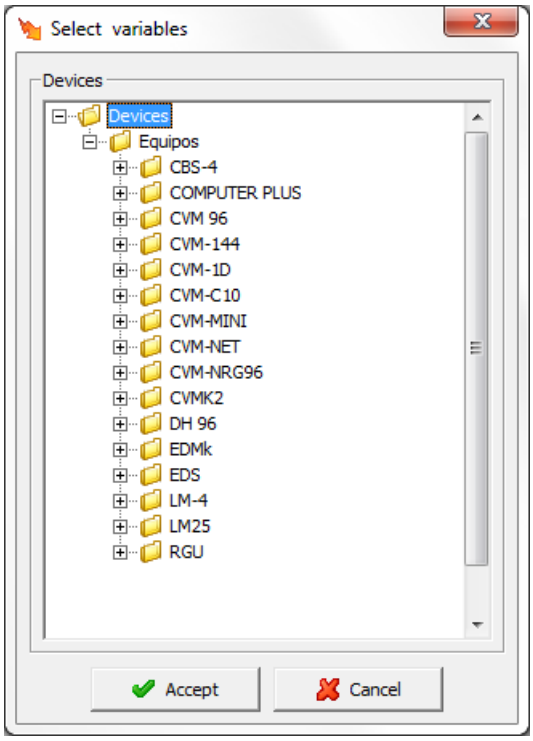
PowerStudio client variables configuration.

Allows loading of a variables configuration that was previously saved to disk. This option is useful when the same variables have to be configured on several PowerStudio clients.

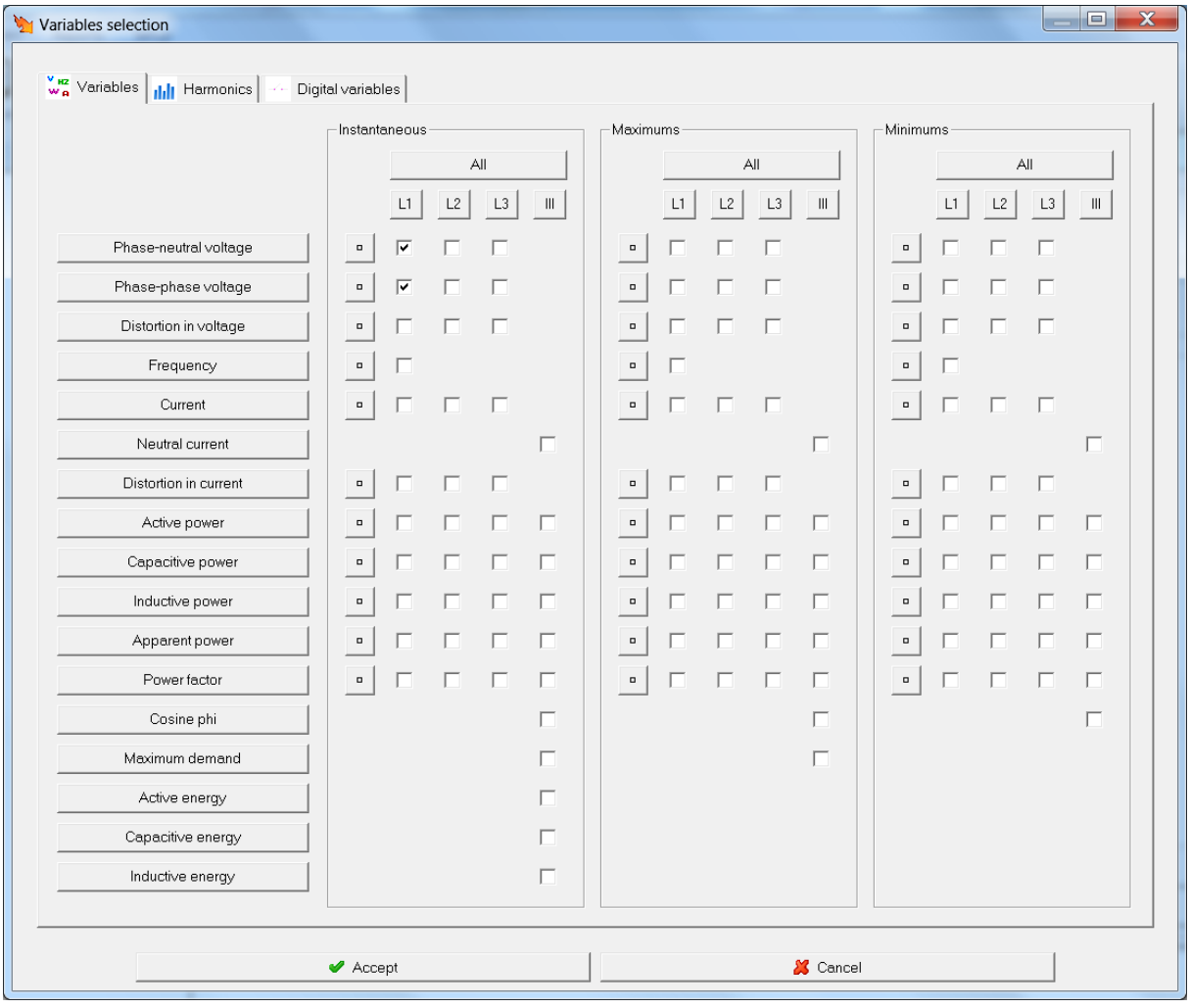
Allows the variable configuration to be saved to disk, so that it can subsequently be loaded on another PowerStudio client.

1.15.2.2.1 Variables

When the 'Add' button is pressed a tree of the remote PowerStudio devices will appear. When a device is selected, its variables selection screen will appear, and the desired variables may be added.



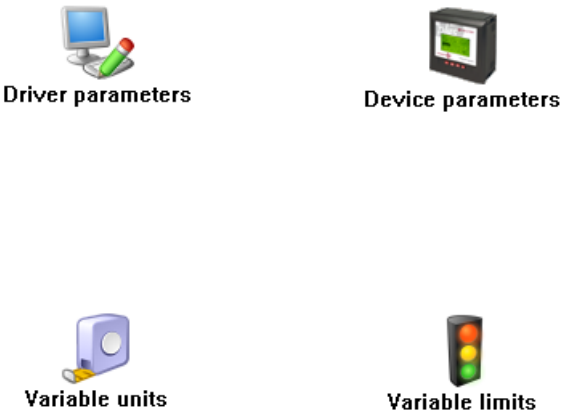
As an example of variables selection screen we have that of an 'CVM' where we can see that the 'Neutral Phase Voltage' and 'Phase-Phase Voltage' variables have been selected.



1.16.- COMPUTER PLUS

1.16.1 Driver options

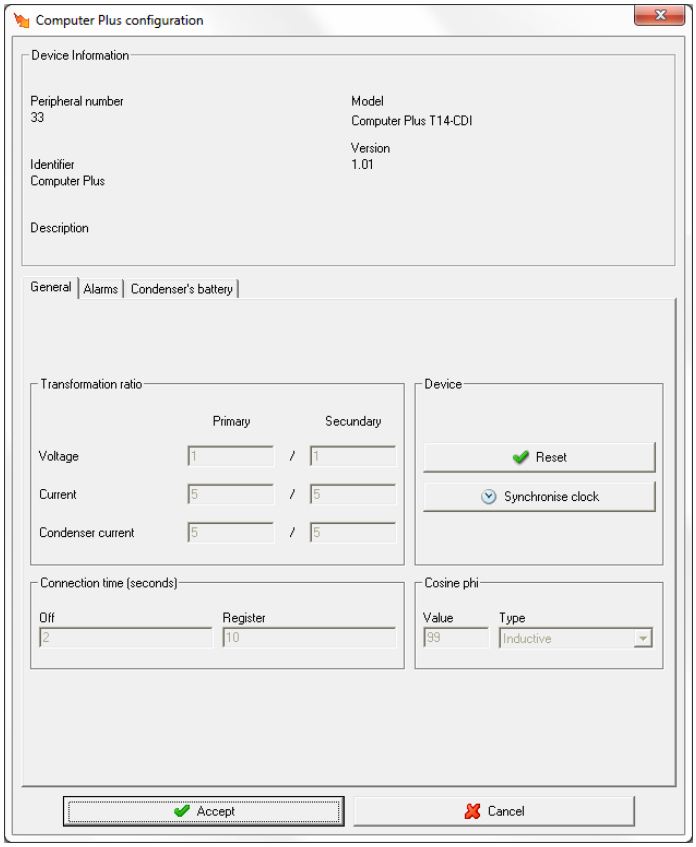
Options menu:



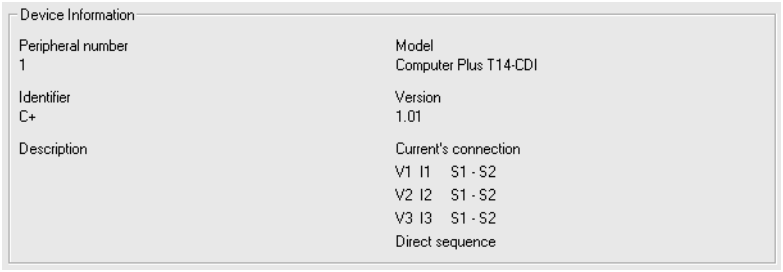
The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

1.16.1.1 Device parameters

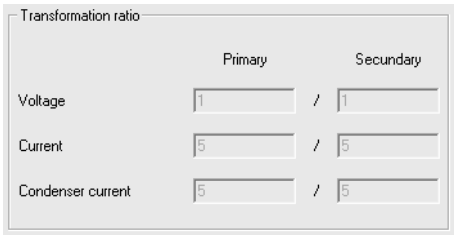
This screen allows the device alarms to be configured. Upon opening the dialogue box, the software will read the device configuration. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.



Depending on the device connected, some fields will be disabled.



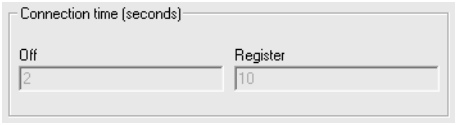
Displays general information.Among other parameters the current connection configuration may be seen.



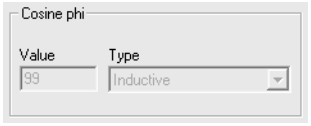
- **Voltage transformation ratio:** Primary and secondary voltage programming. The product of the primary value and the primary current must be the same as or less than 20,000,000.

- **Current transformation ratio:** This is the device primary current value. Value may be between 1 and 30,000 A. The secondary current is 1A or 5A.

- **Capacitor power measure transformation ratio :** The primary capacitor current measure value may be between 1A and 999A. The secondary capacitor current measure value may be between 1A and 5A.



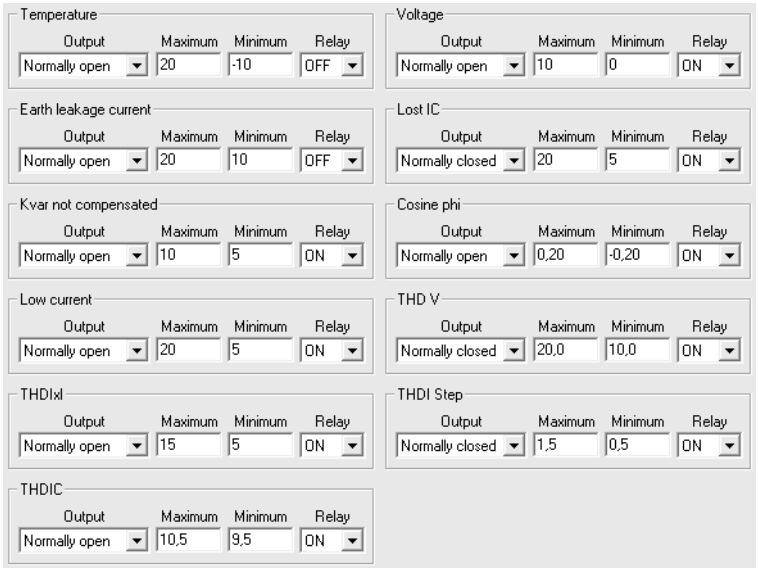
Machine connection and registration times. For the TF, TF-C and TF-CDI models the units are cycles, for the rest of models the units are seconds.



Configuration of the inductive phi or capacitative cosine.

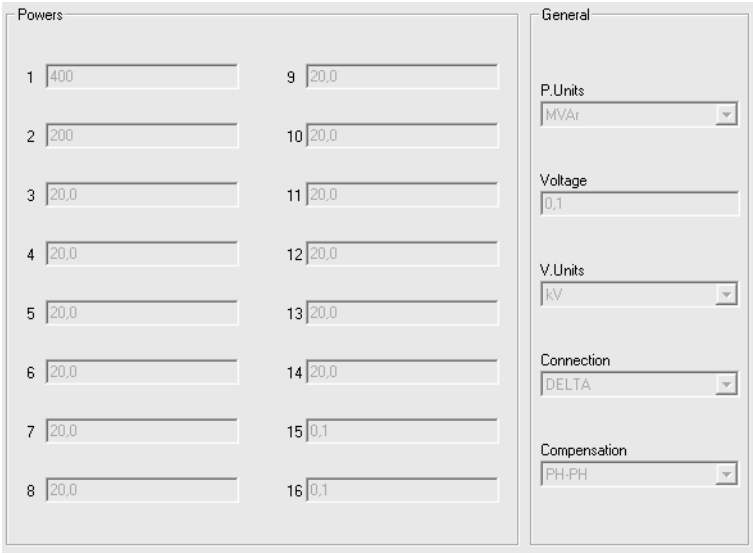
Clicking the button resets the device energy counters to zero.

Clicking the button sends the PC's time of day to the machine.



From the alarms tab we can see how the alarms are configured for temperature, voltage, differential current, ic loss, non-compensated Kvar, phi cosine, low current, thdv, thdixi, thdi step and thdic.

- **Output**: This field shows whether the output is configured as normally open, normally closed or disabled.
- **Max:** In this box the maximum alarm value is indicated.
- **Min:** In this box the minimum alarm value is indicated.
- **Relay**: Allows one to indicate whether or not the alarm is associated with the global alarms relay.

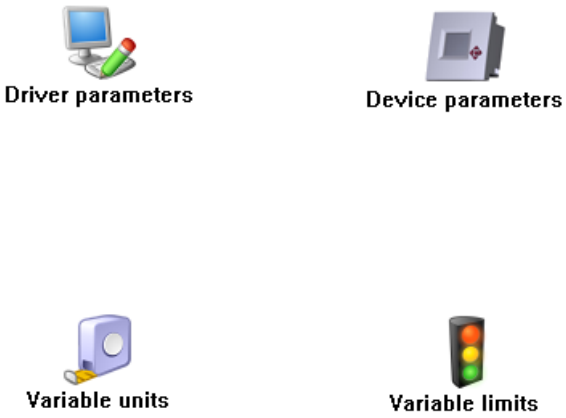


From the capacitors tab the numeric capacity value of the 16 capacitors and their kVar or MVar units, voltage value and their V or kV units, the DELTA or WYE connection type and the type of PH-PH or TRIPH compensation may be seen.

1.17.- COMPUTER SMART

1.17.1 Driver options

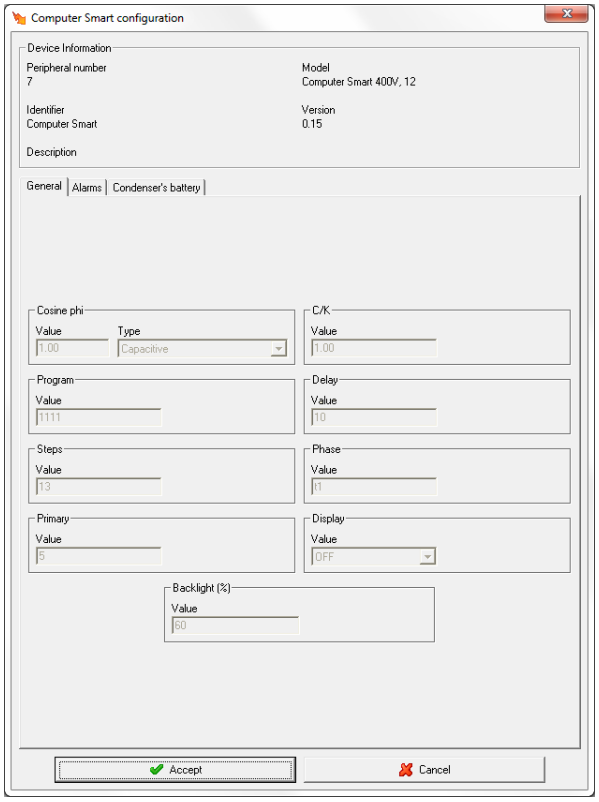
Options menu:



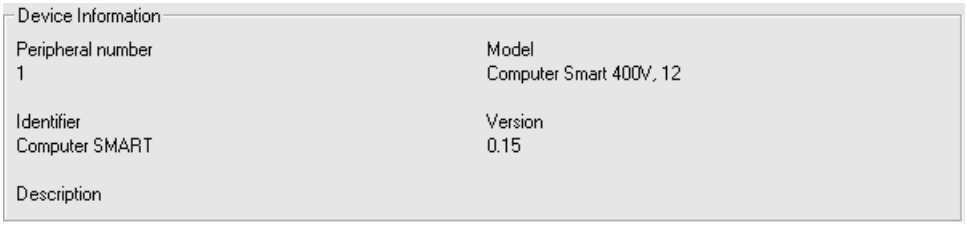
The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.17.1.1 Device parameters

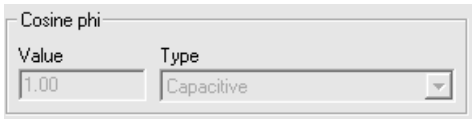
This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.



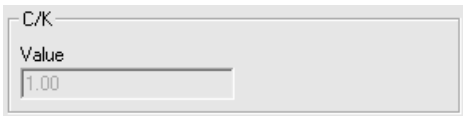
None of the fields in this dialogue box are editable.



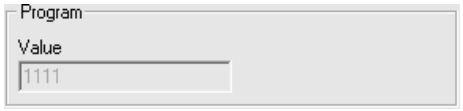
Displays general information about the device.



Displays the value and type of cosine phi. The type may be inductive or capacitive and the value will be between 0 and 1.



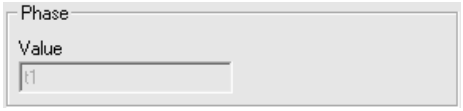
Displays the value of the C/K variable; this value should be between 0 and 1.



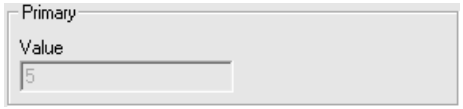
Displays the program value, which can be “1111” or “1222” or “1244” or “1248” or “1122”.

Displays the action delay time in seconds; this value can be between 0 and 1000.

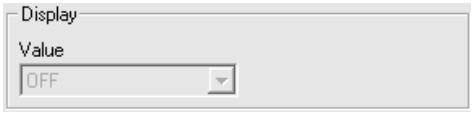
Displays the number of steps + 1.



Displays the phase; its values are t1 to t6.

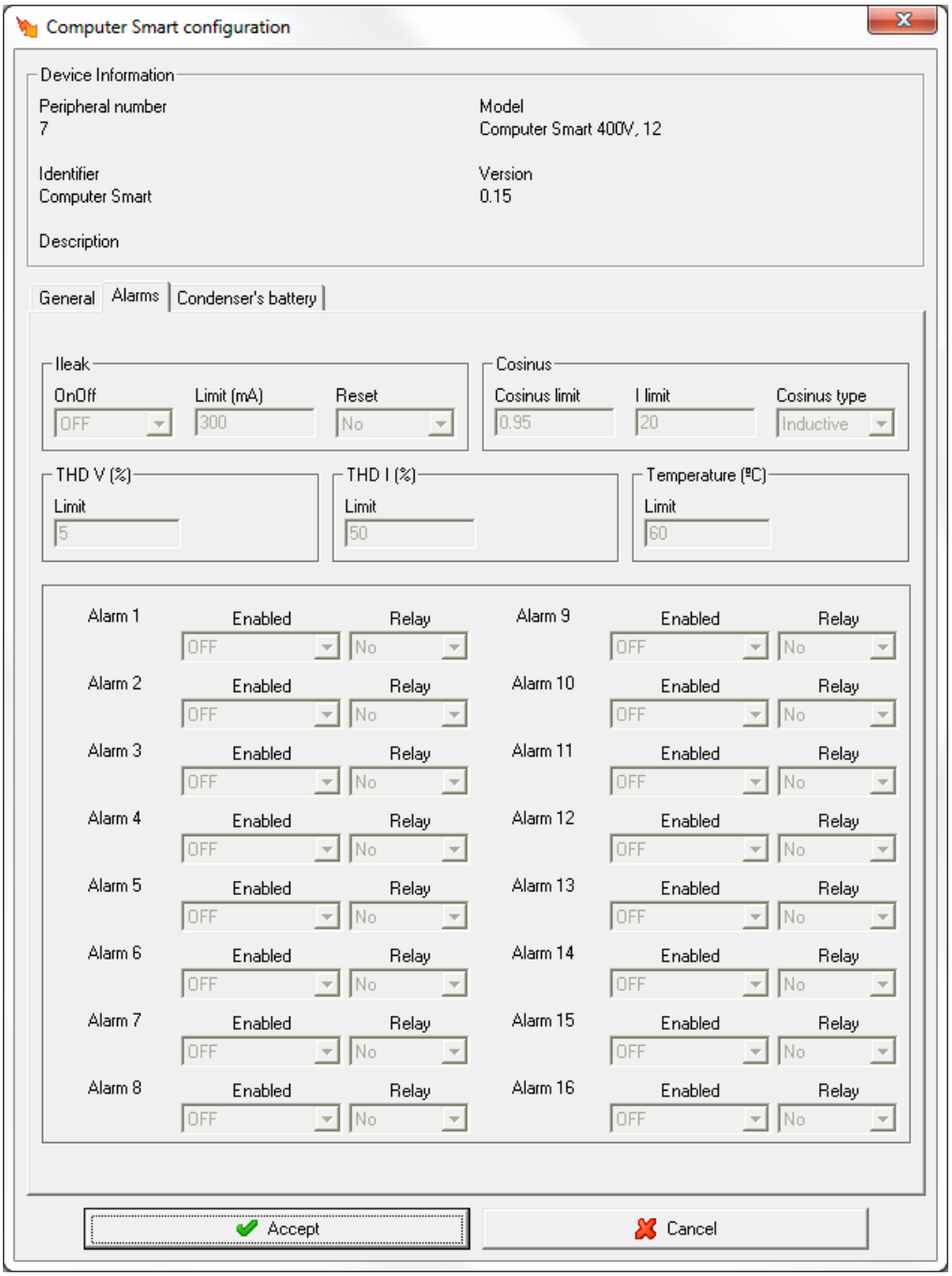


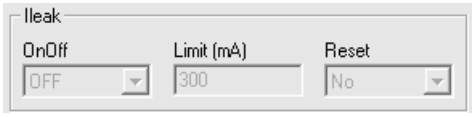
Displays the value of the primary current; these values can range from 0 to 9999.



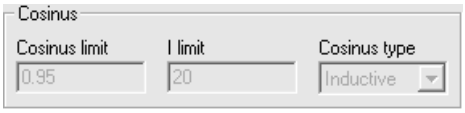
Displays the display status (ON or OFF).

Displays the backlight % value; values between 0 and 100.



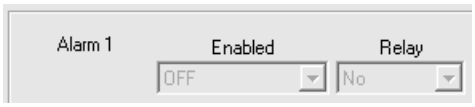


Displays the status, limit and reset of the Ileak alarm. The possible limit values are between 0 and 1500.

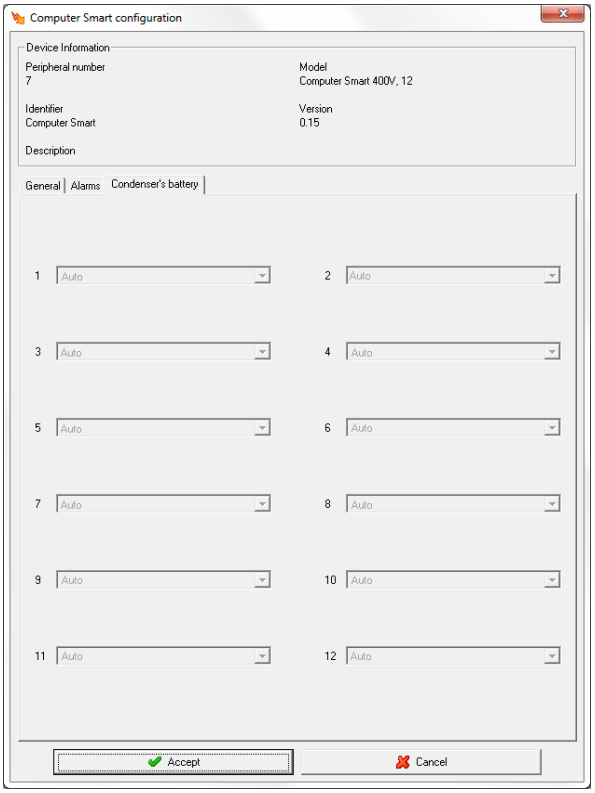


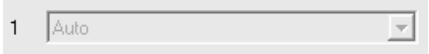
Displays the cosine limit, I limit and the cosine type and cosine alarm. The possible values for the cosine limit are from 0 to 1, those of the I limit are between 0 and 9999, and cosine type can be inductive or capacitive.

Displays the value of the limits for the THD V and THD I alarms in % and that for temperature in ºC; temperature values can be between 0 and 256.



For each of the 16 alarms, it displays whether it is enabled and the associated relay.



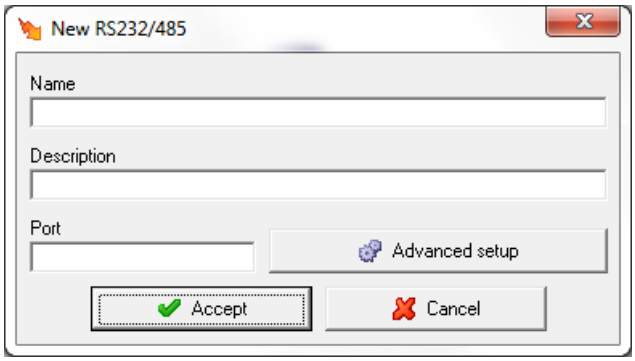


It shows the status of each of the 12 capacitors; the status can be Auto, On or Off.

1.18.- RS232/485 CONVERTER

The RS232/485 converter connects equipment which works with an RS-485 serial connection to the port of the PC with an RS-232 connection.

When adding or modifying this device, see 'Editor Manual', the following dialogue appears



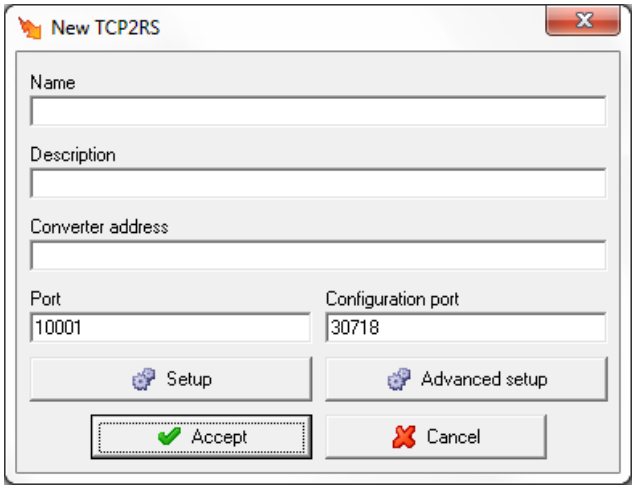
Where

- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Alphanumeric type data to enter a brief description of the device.
- **Port:** Number of the serial port that the program uses for communication with the device.
- **Advanced communication:** Permits the configuration of a series of additional parameters on the device. Refer to 'Editor manual'.

1.19- TCP2RS CONVERTER

The TCP2RS converter connects equipment units that work with serial communication (RS-232 / RS-485) to an Ethernet network using the IP protocol.

When adding or modifying this device, see 'Editor Manual', the following dialogue appears



Where

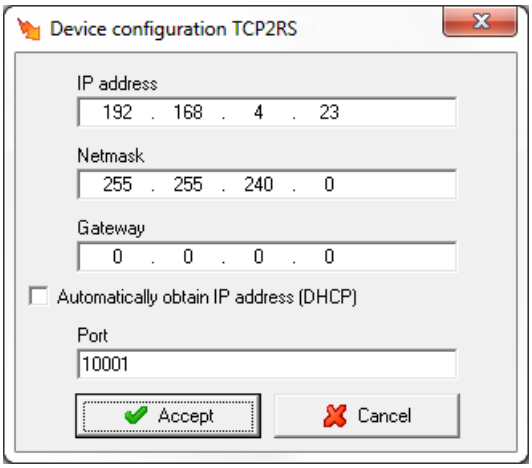
- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Alphanumeric type data to enter a brief description of the device.
- **Address converter:** Corresponds to the address the program uses to communicate with the device. This parameter can be an IP address or a name.This address should not be confused with the MAC address.
- **Port:** Corresponds to the communications port:
- **Configuration port:** Corresponds to the communication port the program uses to configure the device. This port is 30718 by default.

For a TCP2RS device to be able to communicate through a router, perform the following steps:

1-In the *'Address converter'* field enter the router's IP address.
2 - In the *'Port"* field enter the communications port and redirect this port on the router to the device's communications port.
3 - Redirect the configuration port on the router to port 30718 of the converter.

N.B.: For information on re-addressing ports consult the router user manual.

- **Parameters:** By clicking the button a dialogue will appear where a number of parameters of the device can be configured.

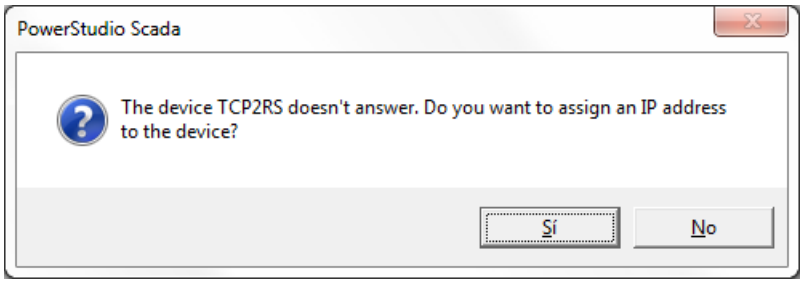


Where:

- *IP address:* Corresponds to the IP address used to communicate with the device.
- *Subnetwork mask:* Corresponds to the subnetwork mask used on the network where the device is connected
- *Predetermined Gateway:* Corresponds to the address of the gateway if the device is not on the same network as the computer containing the program.
- *Obtain an IP address automatically (DHCP):* This option will be enabled when we want the device to automatically receive the IP address via a DHCP server.
- *Port:* Corresponds to the device communications port.

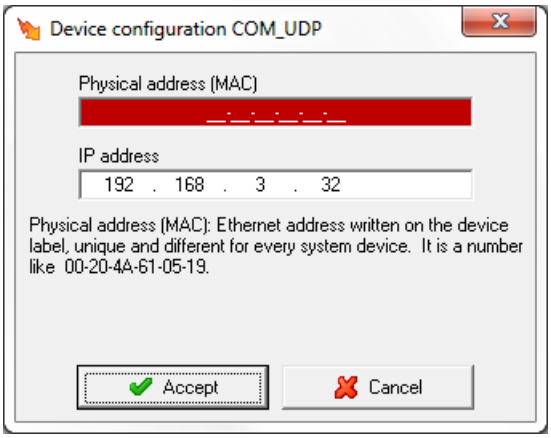
- **Advanced communication:** Permits the configuration of a series of additional parameters on the device. Refer to 'Editor manual'.

On adding or modifying the device, the software will try to detect it. If it is unable to detect it, if the device is new or has not been allocated an IP address or has an allocated IP different to that entered in the *'Converter Address'*, it will ask if you want to assign a new IP address to the converter.



It will only be possible to assign an IP address to the device if it is on the same network as the computer running the program.

If the answer is *'Yes'*, the following dialogue box will appear, which will permit an IP address to be assigned to the device.

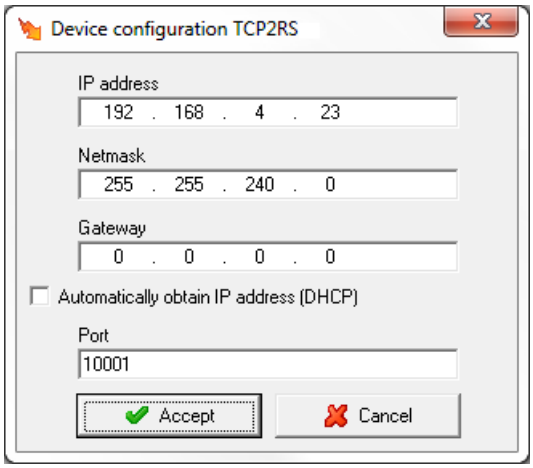

Device configuration COM_UDP
Physical address (MAC)
IP address
192 . 168 . 3 . 32
Physical address (MAC): Ethernet address written on the device label, unique and different for every system device. It is a number like 00-20-4A-61-05-19.
Accept
Cancel

Where:

- **Physical address (MAC):** Ethernet address that each device has, which is unique and distinct on all network devices. The hardware address that any network interface has. Will be of the type 00-20-4A-61-05-19.

- **IP address:** IP Address to be allocated to the device that has the physical address introduced in the previous field.

If it is possible to assign an IP address to the converter, the following dialogue box will appear:

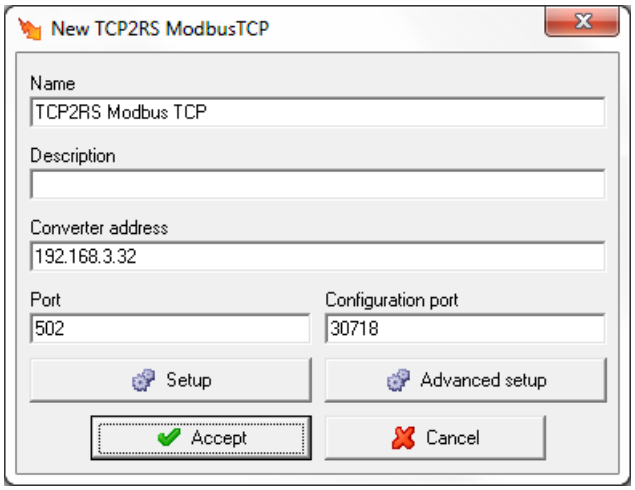


To finish setting up the rest of the parameters for communication with the device.

1.20.- TCP2RS MODBUSTCP CONVERTER

The TCP2RS converter connects equipment which works with serial communication (RS-232 / RS-485) to an Ethernet network using the IP protocol (ModbusTCP for connection–oriented communications).

When adding or modifying this device, see 'Editor Manual', the following dialogue appears



Where

- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Alphanumeric type data to enter a brief description of the device.
- **Address converter:** Corresponds to the address the program uses to communicate with the device. This parameter can be an IP address or a name.This address should not be confused with the MAC address.
- **Port:** Corresponds to the communications port:By default the Modbus TCP protocol will communicate through port 502.
- **Configuration port:** Corresponds to the communication port the program uses to configure the device. This is port 30718 by default.

Unlike TCP2RS devices, the program does not configure any Modbus TCP device parameters automatically, using the configuration port only to detect and verify that the device configuration is correct. To configure or assign an IP address to Modbus TCP devices, consult the device manual.

For a TCP2RS device to be able to communicate through a router, perform the following steps:

1 – In the *'Address converter'* field enter the router's IP address.
2 – In the *'Port"* field enter the communications port and redirect this port on the router to the device's communications port.
3 – Redirect the configuration port on the router to port 30718 of the converter.

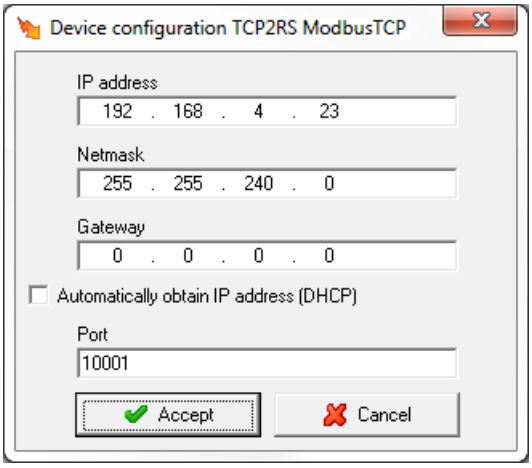
N.B.: For information on re-addressing ports consult the router user manual.

There are some second-tier devices that when connecting to a Modbus TCP device require manual configuration, the communication is limited to display, for Modbus TCP these devices cannot be configured. Devices of this nature are:

- CVM – B / BD
- CVMK
- CVMK – HAR

The special characteristics, as well as the pertinent configuration to carry out correct Modbus TCP connection are specified in the corresponding sections of each device.

- **Parameters:** Clicking the button will cause a dialogue will appear where a number of device parameters can be configured.

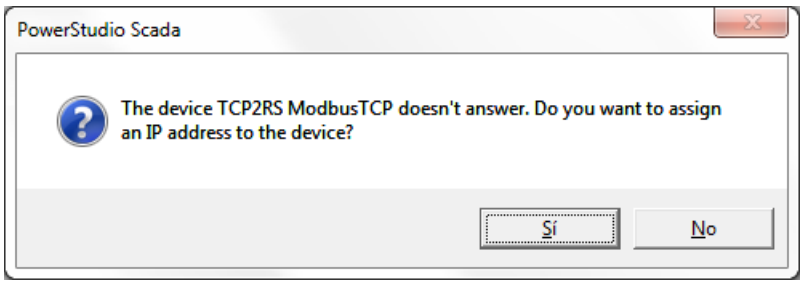


Where:

- *IP address:* Corresponds to the IP address used to communicate with the device.
- *Subnetwork mask:* Corresponds to the subnetwork mask used on the network where the device is connected
- *Predetermined Gateway:* Corresponds to the address of the gateway if the device is not on the same network as the computer containing the program.
- *Obtain an IP address automatically (DHCP):* This option will be enabled when we want the device to automatically receive the IP address via a DHCP server.

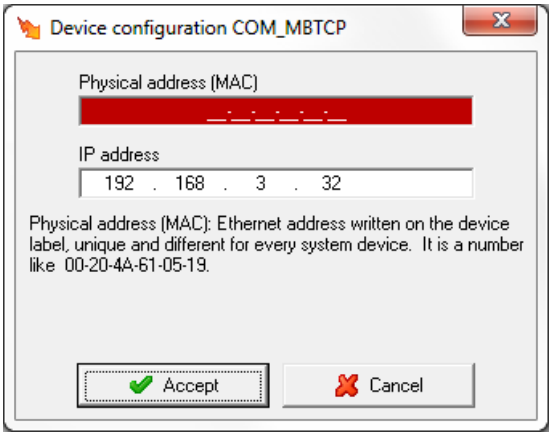
- **Advanced communication:** Permits the configuration of a series of additional parameters on the device. Refer to 'Editor manual'.

On adding or modifying the device, the software will try to detect it. If it is unable to detect it, if the device is new or has not been allocated an IP address or has an allocated IP different to that entered in the *'Converter Address'*, it will ask if you want to assign a new IP address to the converter.



It will only be possible to assign an IP address to the device if is on the same network as the computer running the program.

If the answer is *'Yes'*, the following dialogue box will appear, which will permit an IP address to be assigned to the device.

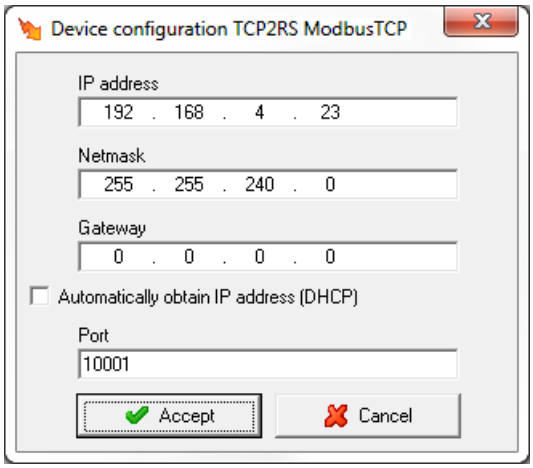

Device configuration COM_MBTCP
Physical address (MAC)
IP address
192 . 168 . 3 . 32
Physical address (MAC): Ethernet address written on the device label, unique and different for every system device. It is a number like 00-20-4A-61-05-19.
Accept
Cancel

Where:

- **Physical address (MAC):** Ethernet address that each device has, which is unique and distinct on all network devices. The hardware address that any network interface has. Will be of the type 00-20-4A-61-05-19.

- **IP address:** IP Address to be allocated to the device that has the physical address introduced in the previous field.

If it is possible to assign an IP address to the converter, the following dialogue box will appear:



To finish setting up the rest of the parameters for communication with the device.

1.21.- TCP2RS QNA RS485 CONVERTER

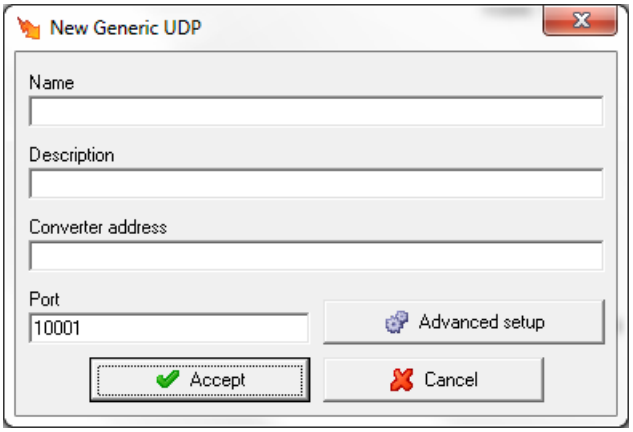
The TCP2RS QNA RS485 converter connects QNA devices which work with serial communications RS-485 on an Ethernet network using IP protocol.

Due to the peculiarities of the communication with QNA devices, only QNA-412 and QNA-413 second-level devices will be able to be connected to TCP2RS QNA RS485 first-level devices.

For more information on how to add and configure this device see section 1.19 TCP2RS converter.

1.22.- GENERIC UDP CONVERTER[4]

The generic UDP converter connects devices that use serial communications (RS-232/RS-485) to an Ethernet network using the IP protocol (UDP for datagram communications).



Where

- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Alphanumeric type data to enter a brief description of the device.
- **Address converter:** Corresponds to the address the program uses to communicate with the device. This parameter can be an IP address or a name.This address should not be confused with the MAC address.
- **Port:** Corresponds to the communications port:
- **Advanced communication:** Permits the configuration of a series of additional parameters on the device. Refer to 'Editor manual'.

Due to the large number of converters that can be found on the market. On adding this device the program will not attempt to detect or verify that the configuration is correct.

The configuration and the proper functioning of communications between the converter and the program is the responsibility of user.

For more information on how to configure the converter consult the device manual.

[4] Only in Deluxe version

1.23.- GENERIC TCP CONVERTER[5]

The generic TCP converter connects devices that work with serial communication (RS-232/RS-485) to an Ethernet network using the IP protocol (TCP for connection-oriented communications).

Due to the large number of converters that can be found on the market. On adding this device the program will not attempt to detect or verify that the configuration is correct.

The configuration and the proper functioning of communications between the converter and the program is the responsibility of user.

For more information on how to configure the converter consult the device manual.

For more information on how to configure this converter see section 1.22 Generic UDP converter.

1.24.- MODBUSTCP GENERIC CONVERTER[6]

The ModbusTCP generic converter connects devices that work with serial communication (RS-232/RS-485) to an Ethernet network using the IP protocol (ModbusTCP for connection-orientated communications).

Due to the large number of converters that can be found on the market. On adding this device the program will not attempt to detect or verify that the configuration is correct.

The configuration and the proper functioning of communications between the converter and the program is the responsibility of user.

For more information on how to configure the converter consult the device manual.

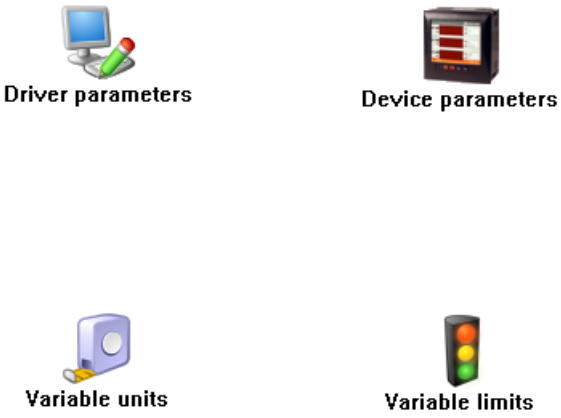
For more information on how to configure this converter see section 1.22 Generic UDP converter.

[5] Only in Deluxe version
[6] Only in Deluxe Version

1.25.- CVM-144

1.25.1 Driver options

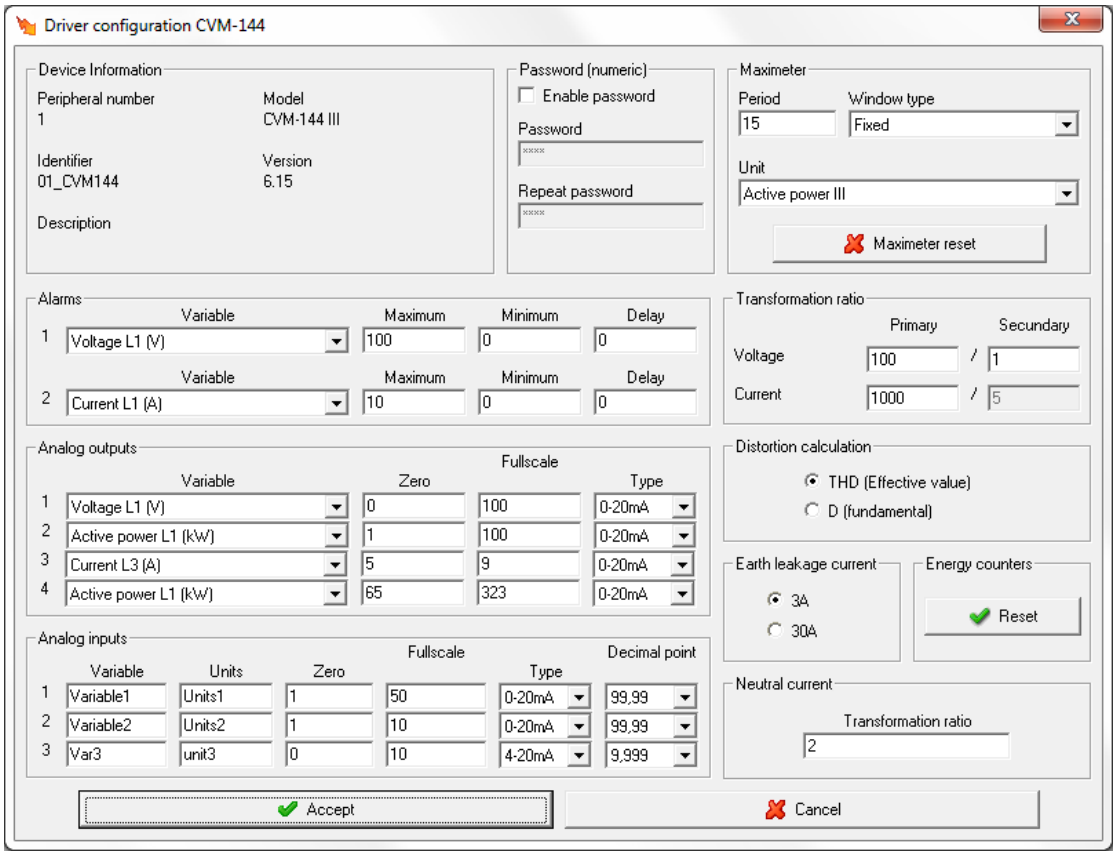
Options menu:



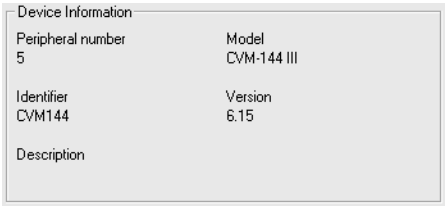
The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.25.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

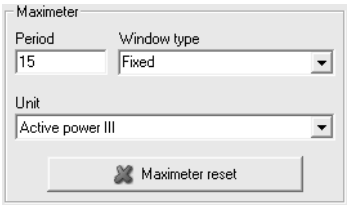


Depending on the device connected, some fields will be disabled.

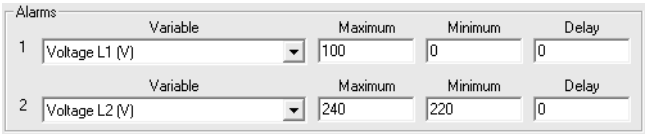


Displays general information.

Allows the password to be enabled or disabled to lock the keyboard configuration of the device.

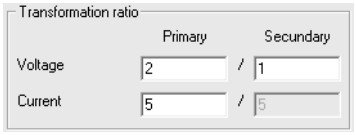


- **Period:** The integration period of the maximeter, which can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Unit**: The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- **Maximeter reset:** When the button is pressed, the device maximeter goes to zero.



This section shows the configuration of the device relay outputs, configuration is possible with the required values.

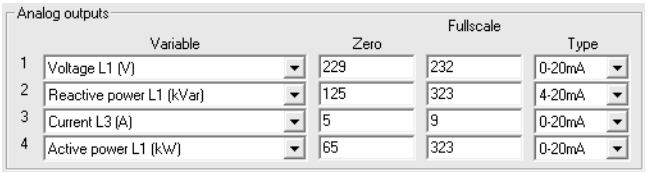
- **Variable:** The parameters associated with the relay are indicated in this field. The output is programd as an alarm, allowing any of the parameters measured by the CVM-144 to be controlled. The units in which the maximum and minimum values of the alarm are expressed are indicated in brackets.
- **Max:** This box indicates the maximum value to be controlled.
- **Min:** This box indicates the minimum value to be controlled.
- **Delay:** Delay in seconds of the alarm. The maximum value is 9999 seconds.



- **Voltage transformation ratio:** Primary and secondary voltage programming. The product between the primary value and the primary current must be the same as or less than 20,000,000. The primary value, depending on fullscale, must be between 1 and the value of the following table:

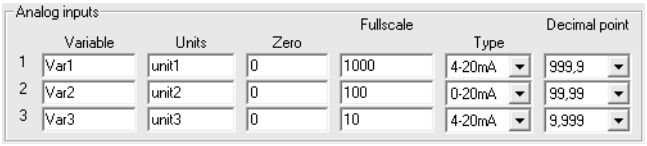
Full-scale	Maximum value.
110v	99.999
275v	70.000
300v	70.000
500v	40.000

- **Current transformation ratio:** This is the device primary current value. Value may be between 1 and 10,000 A. The secondary current is 5A in the CVM-144.

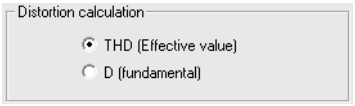


This section shows the configuration of the device analogue outputs, and the option is given to configure them with the desired values.

- **Variable:** Permits any parameter measured by the CVM-144 to be selected, except parameters corresponding to energy.
- **Full scale:** Value of the parameter to which the zero of the scale is assigned.
- **Full scale:** Value of the parameter to which the maximum value of the scale is assigned.
- **Type:** Output type, allows outputs 0 – 20 mA, 4 – 20 mA or 0 – 10 V to be chosen, depending on the device.

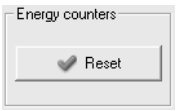


- **Variable:** This indicates the name associated with the analogue input.
- **Units:** This indicates the type of units the variable represents.
- **Full scale:** Value of the parameter to which the zero of the scale is assigned.
- **Full scale:** Value of the parameter to which the maximum value of the scale is assigned.
- **Type:** Input type, allows inputs of 0 – 20 mA, 4 – 20 mA or 0 – 10 V to be chosen, depending on the device.
- **Decimal point:** Position of the decimal point. Only if the device allows us to display the analogue inputs with real measurement values.



Using this selector the type of distortion that the device will calculate can be configured.

Using this, the differential current of the device can be configured. Only for those devices that can measure differential current.



Clicking the button will reset the energy counters on the device to zero.

Neutral current transformation ratio configuration. Only for those devices that can differential current.

1.26.- CVM- 1D

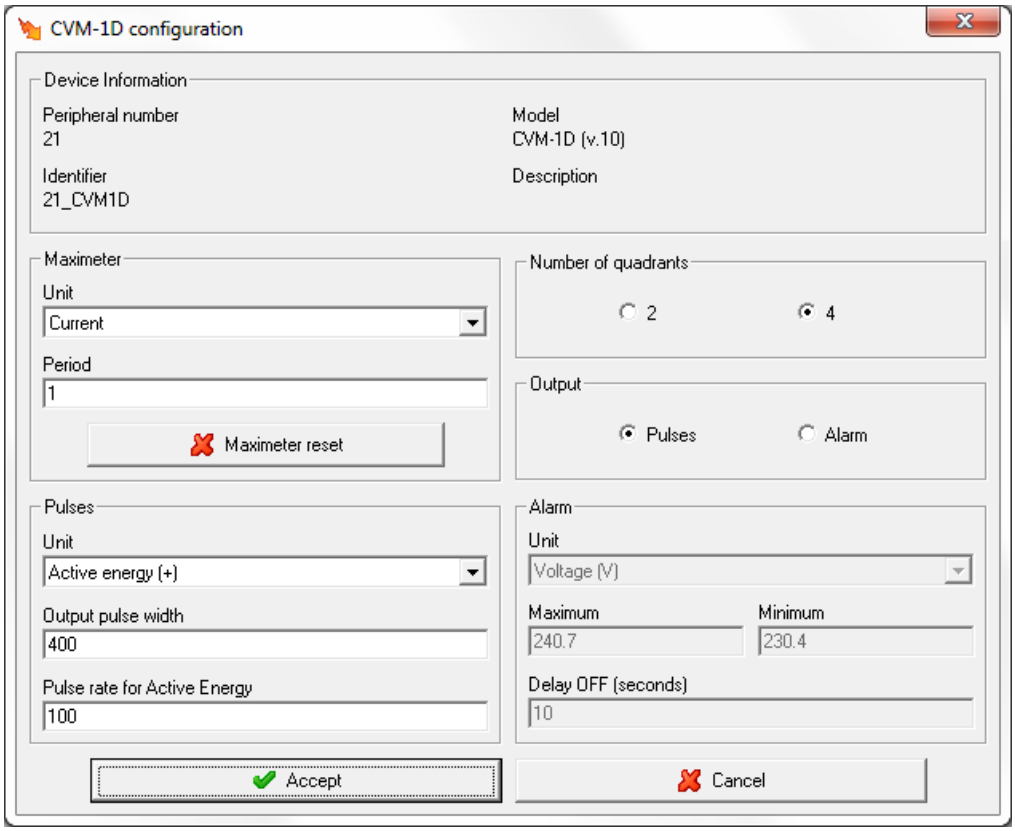
1.26.1 Driver options

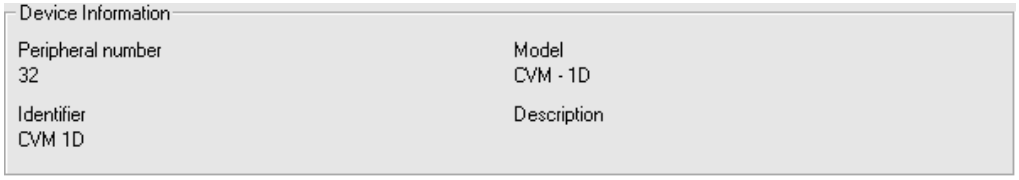
Options menu:

The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

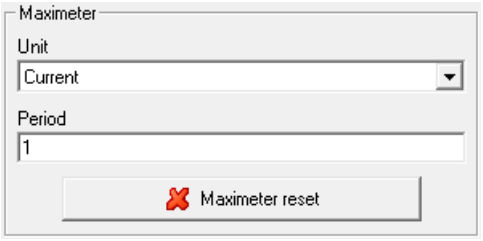
1.26.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.





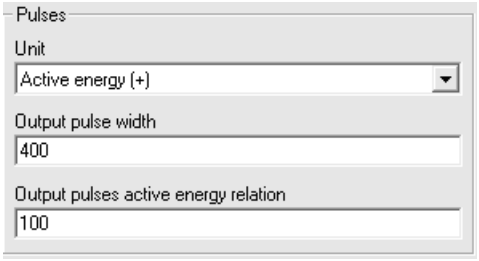
Displays general information about the device.



- **Period**: Maximeter integration period, which can vary between 1 and 60 minutes.
- **Unit**: Maximum demand can be calculated using the active or current power.
- **Maximeter reset:** Pushing the button resets the maximeter to zero.

This allows you to select the number of quadrants to use for the output of pulses. With only two quadrants you can select the energy consumed, with four quadrants you can select the energy consumed and generated.

Select the output you would like to use, only one can be active.

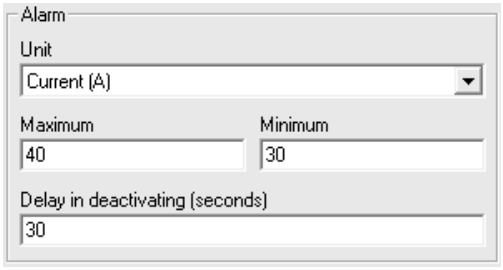


Pulse output. This option will be activated on selecting pulse output.

- **Unit**: Allows you to select between active and reactive energy. If two quadrants are selected, you can only select the energy consumed; however, if four quadrants have been selected, you can select the energy consumed and generated.

- **Output pulse width**: The values will be between 100 and 4000 ms.

- **Output pulse active energy ratio**: The number of pulses/kWh must be between 1 and 100.



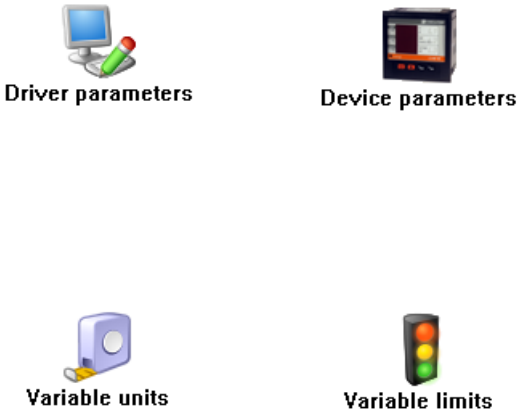
Alarm output. This option will be activated on selecting the alarm output.

- **Unit**: Allows you to select between the voltage, current, powers, power factor, and maximeter.
- **Max:** Maximum alarm value.
- **Min:** Minimum alarm value.
- **Delay in deactivating (seconds)**: Value between 0 and 60 seconds.

1.27.- CVM-96

1.27.1 Driver options

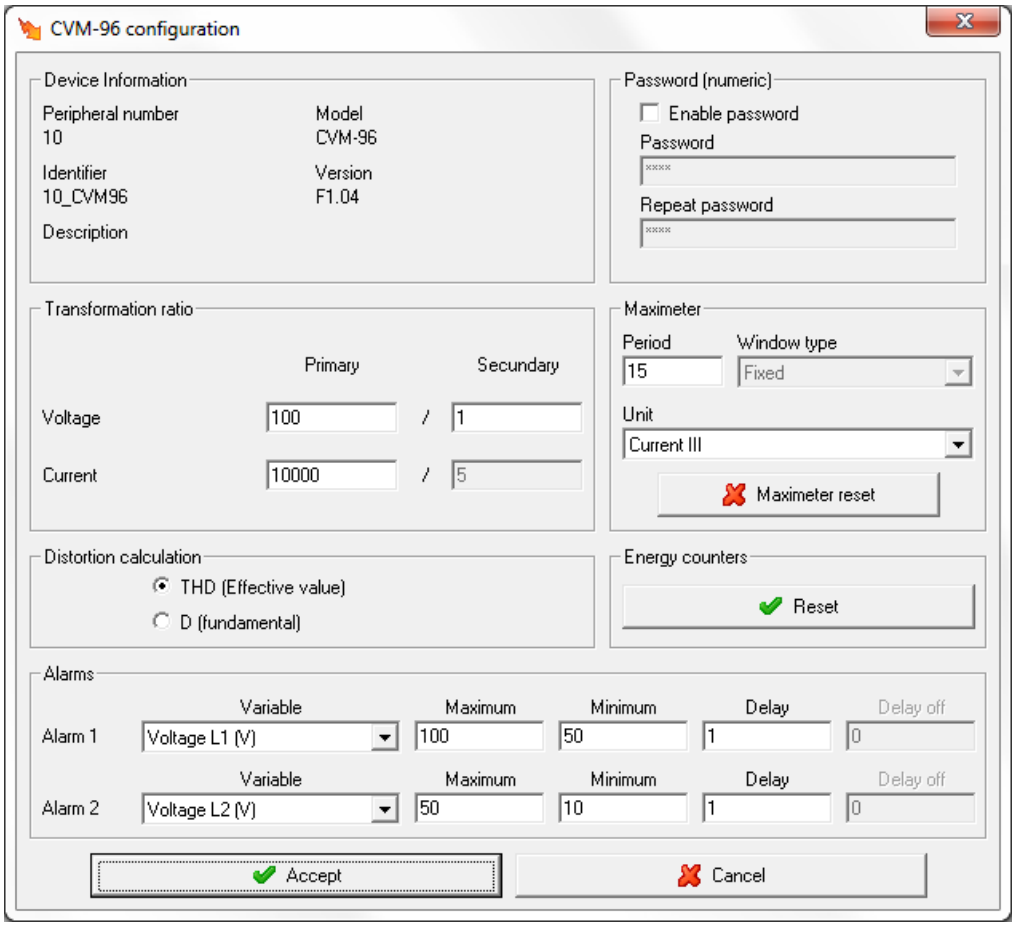
Options menu:

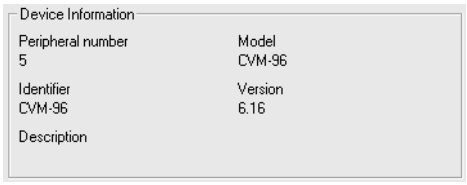


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

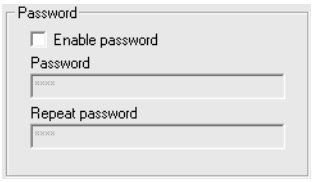
1.27.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

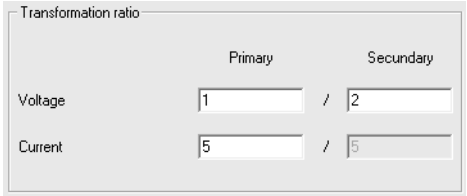




Shows general information.



Enables the password to be enabled or deactivated to block the configuration of the device by means of the keyboard.

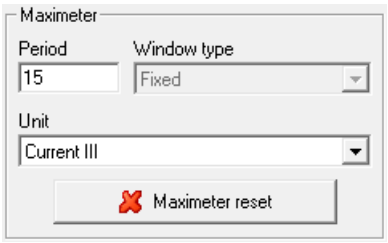


Depending on the version connected, programming of the voltage transformation ratio can be disabled.

- **Voltage transformation ratio:** Primary and secondary voltage programming. The product of the primary value and the primary current must be the same as or less than 20,000,000. The value of the primary, depending on the fullscale of the equipment, must be between 1 and the corresponding value from the following table:

Full-scale	Maximum value.
110v	99.999
275v	70.000
300v	70.000
500v	40.000

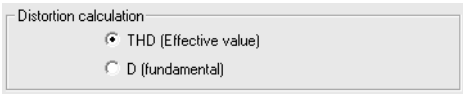
- **Current transformation ratio:** This is the device primary current value. Value may be between 1 and 10,000 A. The secondary current is 5A in the CVM-96.



- **Period:** Is the maximeter integration period can vary between 1 and 60 minutes.

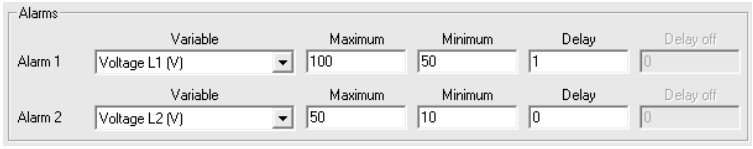
- **Unit**: The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.

- **Maximeter reset:** When the button is pressed, the device maximeter resets to zero.



Use this selector to configure the type of distortion the device will calculate.

Clicking the button will reset the energy counters on the device to zero.



This section shows the configuration of the device relay outputs, configuration is possible with the required values.

- **Variable:** The parameters associated with the relay are indicated in this field. The output is programd as an alarm, and can control any of the parameters measured by the CVM-96. The maximum and minimum alarm unit values are indicated in brackets.

- **Max:** This box indicates the maximum value to be controlled.

- **Min:** This box indicates the minimum value to be controlled.

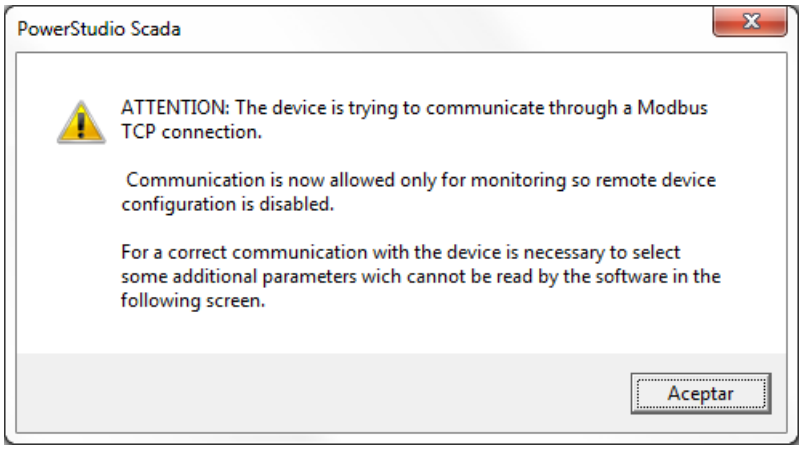
- **Delay:** Alarm delay in seconds. The maximum value is 9999 seconds.

1.28.- CVM-B/BD

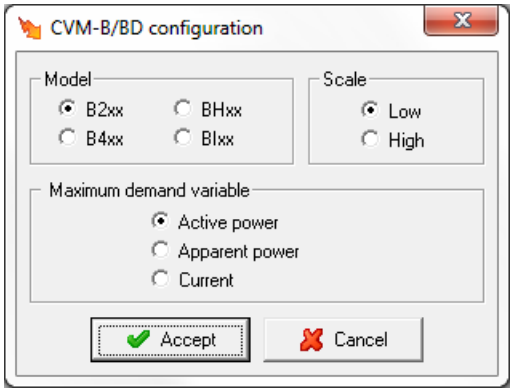
1.28.1 Modbus TCP connection

The CVM-B/BD devices can connect with MODBUSTCP connections with some limitations. PowerStudio can read the values measured by the device but cannot read the configuration. Although it is not possible to read the configuration, for the correct value display, PowerStudio needs to know certain information about the device. This information should be entered by the user, and it will be the responsibility of the user to ensure that the data corresponds to the device connected. If this data introduced by the user were incorrect it could give communication errors making it impossible for PowerStudio to show the values measured by the device.

When adding a device on a MODBUSTCP connection, see 'Editor Manual'. PowerStudio displays the following warning:


PowerStudio Scada
ATTENTION: The device is trying to communicate through a Modbus TCP connection.
Communication is now allowed only for monitoring so remote device configuration is disabled.
For a correct communication with the device is necessary to select some additional parameters wich cannot be read by the software in the following screen.
Aceptar

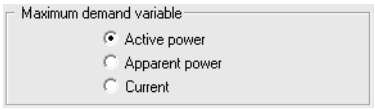
Then a dialogue box will appear with the information PowerStudio needs to communicate with the device.



The user must select the correct information corresponding to the device connected.

Device model. Using the model, PowerStudio can ascertain which variables are measured by the device thus avoiding variables not possessed by the device being asked for.

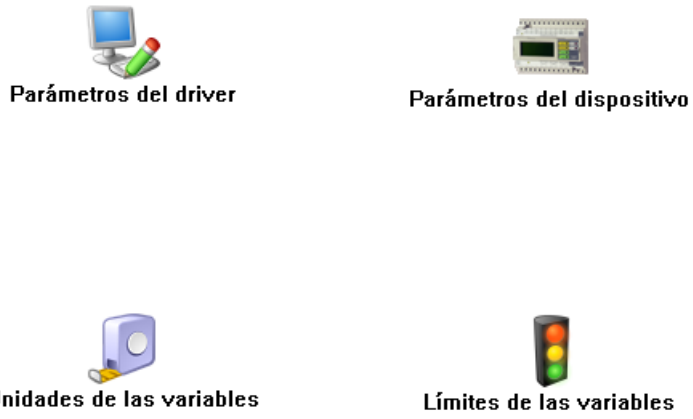
Variables measurement scale. This will be used by PowerStudio for the correct display of values shown on screen



Variable used to calculate the maximum demand.

1.28.2 Driver options

Options menu:

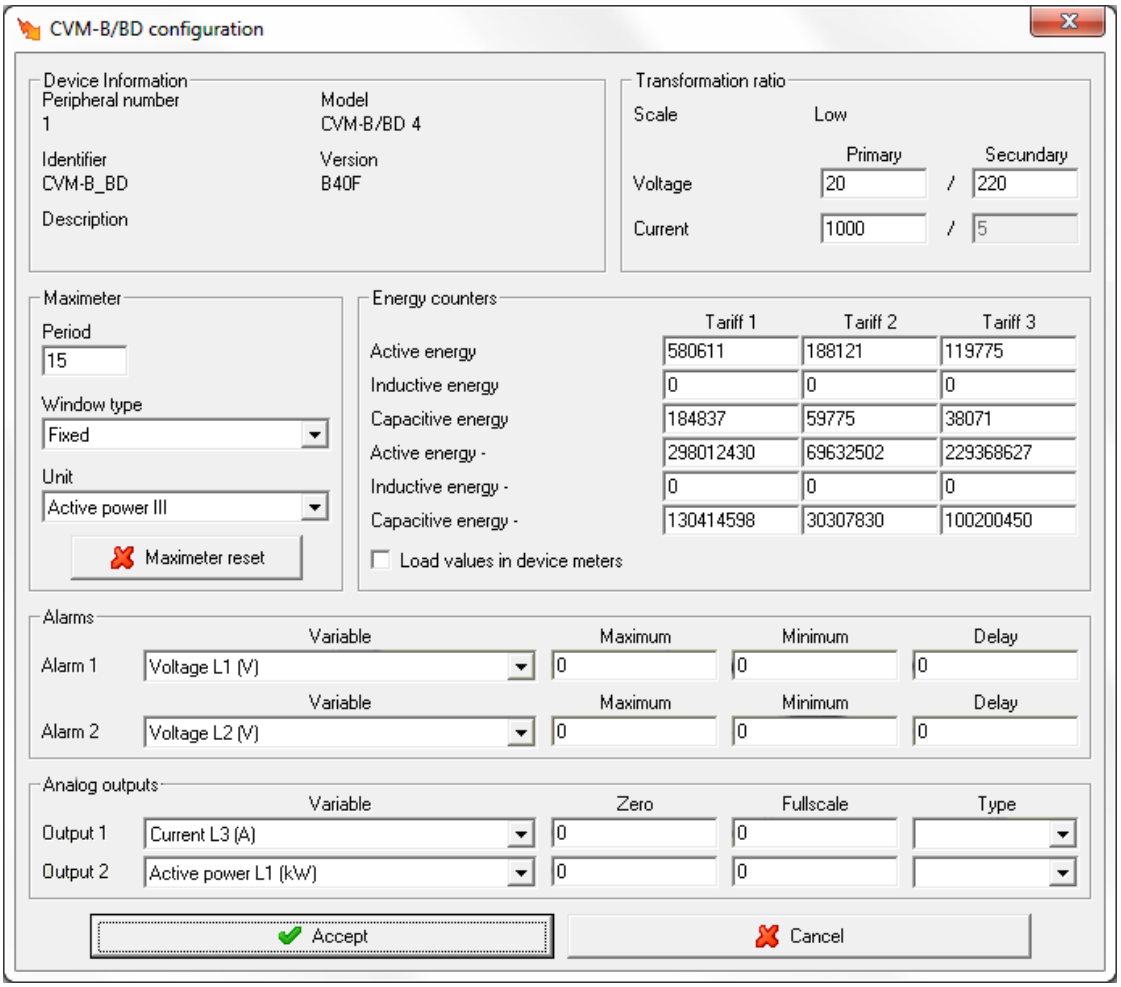


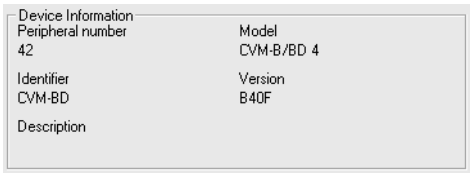
The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

1.28.2.1 Device parameters

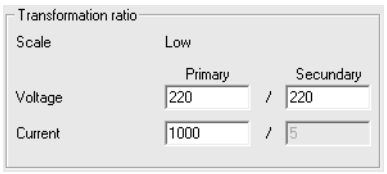
It is not possible to configure the device when it communicates via the MODBUSTCP connection.

This screen allows the internal parameters of the device to be configured. Upon opening the dialogue box, the software will read the device configuration. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.





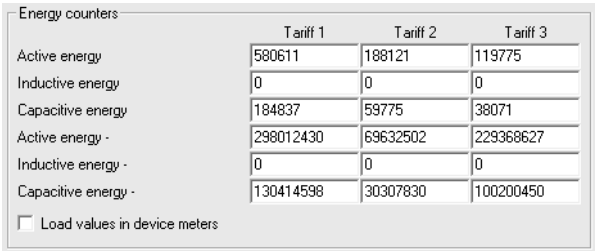
Displays general information.



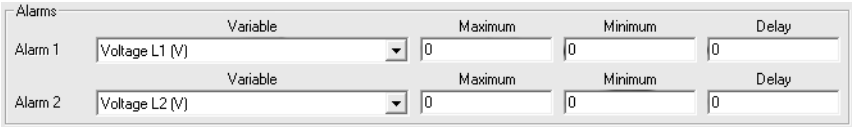
- **Voltage transformation ratio:** Primary and secondary voltage programming. The primary voltage value should be between 1 and 500000 V and the secondary between 1 and 999. In addition the primary divided by the secondary must be less than 9090.

- **Primary current transformer:** This is the device primary current value. Value may be between 1 and 10000 A. Secondary current in the CVM-K is 5A .

- **Period:** This is the maximeter integration period and can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Unit**: Maximum demand can be calculated with active voltage III, apparent voltage III, or current III.
- **Maximeter reset:** Pushing the button resets the maximeter to zero.

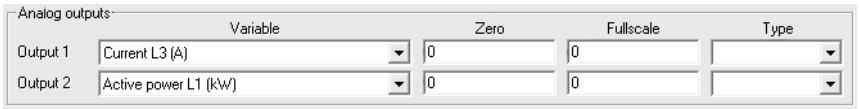


This part of the configuration corresponds to device energies. Depending on the type of device some or all of the fields can be deactivated. If the selector is checked, sending the configuration will load the energy counter with the values entered into the corresponding boxes.



If the connected device has relay outputs, they can be configured with the values desired.

- **Variable**: Parameter associated to the output relay. The output is programmed with an alarm, making it possible to control any of the parameters measured by the CVM-B/BDThe maximum and minimum alarm unit values are indicated in brackets.
- **Max:** This box indicates the maximum value to be controlled.
- **Min:** This box indicates the minimum value to be controlled.
- **Delay**: Alarm delay in seconds. The maximum value is 9999 seconds.



If the device has analogue outputs, the desired values can be configured.

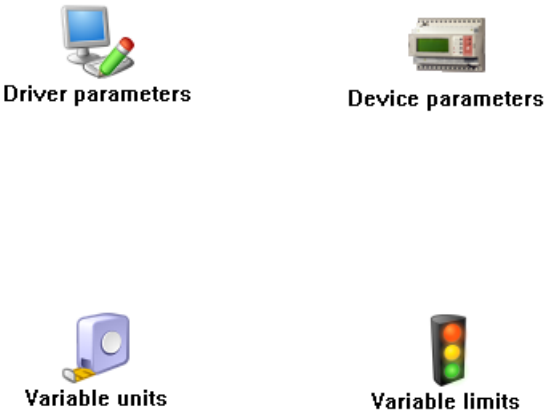
- **Variable**: Parameter associated to the analogue output. Any parameter measured by the CVM-B/BD can be selected as an analogue output.
- **Zero:** Value of the parameter to which the zero of the scale is assigned.

- **Fullscale:** Value of the parameter to which maximum value of the scale is assigned.
- **Type:** Type of input, permits either 0-20 mA or 4-20 mA to be chosen.

1.29.- CVM-BC

1.29.1 Driver options

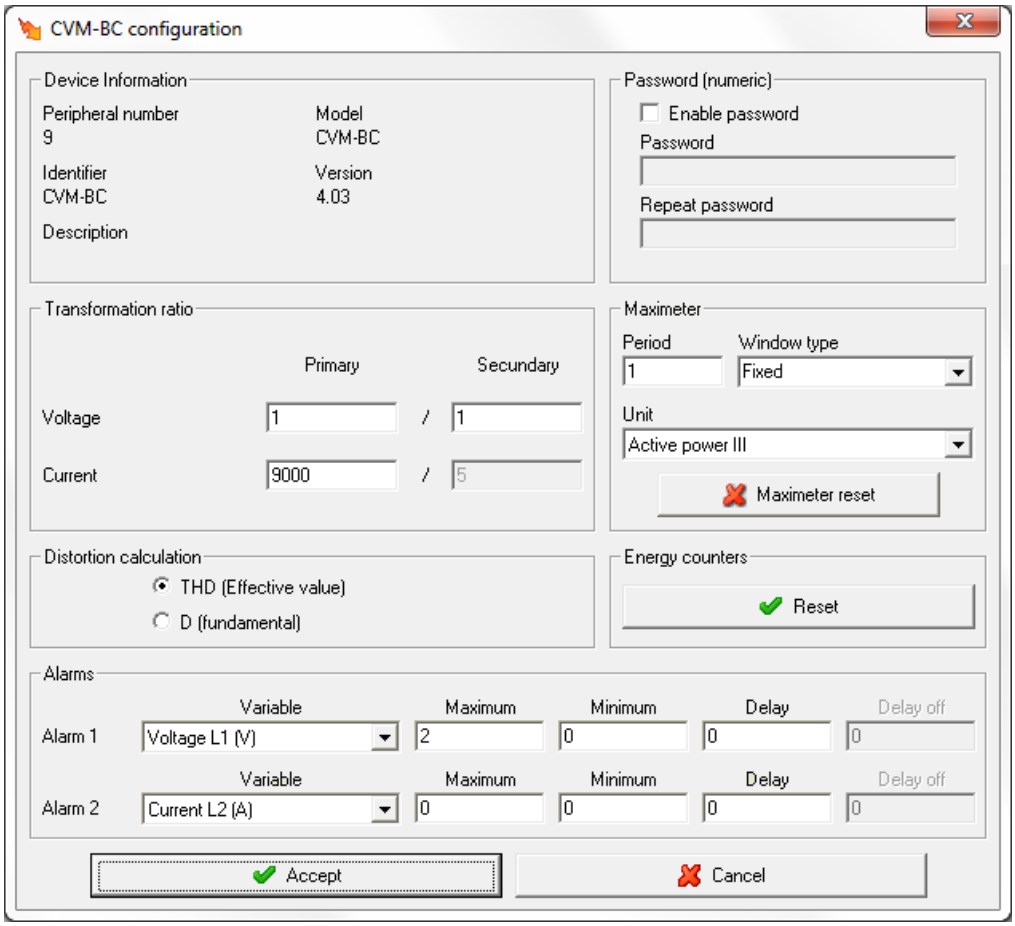
Options menu:

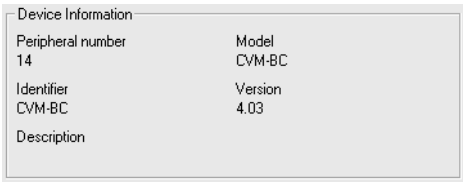


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

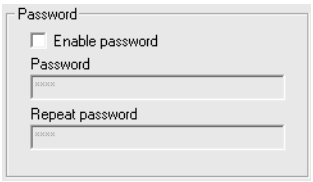
1.29.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. Upon opening the dialogue box, the software will read the device configuration. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

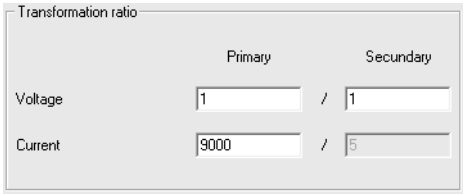




Displays general information.



Enables the password to be enabled or deactivated to disable configuration of the device using the keyboard.

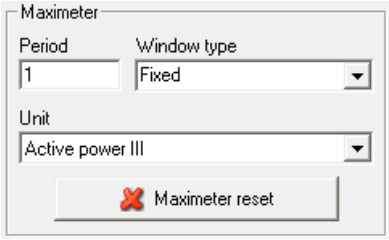


Depending on the version connected, programming of the voltage transformation ratio can be disabled.

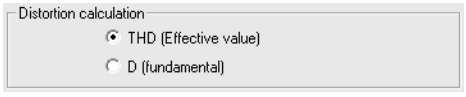
- **Voltage transformation ratio:** Primary and secondary voltage programming. The product between the primary value and the primary current must be the same as or less than 20.000.000. The primary value, depending on fullscale, must be between 1 and the value of the following table:

Full-scale	Maximum value.
110v	99.999
275v	70.000
300v	70.000
500v	40.000

- **Current transformation ratio:** This is the device primary current value. Value may be between 1 and 10,000 A. Secondary current in the CVM-BC is 5A.

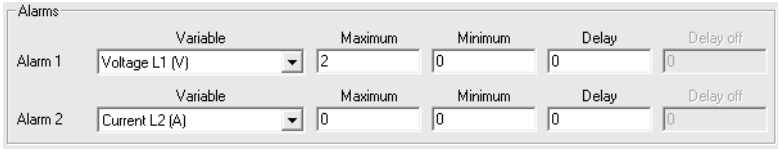


- **Period**: This is the maximeter integration period and can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Unit**: The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- **Maximeter reset:** Pushing the button resets the maximeter to zero.



Use this selector to configure the type of distortion the device will calculate.

Clicking the button will reset the energy counters on the device to zero.



This section shows configuration of the device relay outputs, which may be configured as desired.

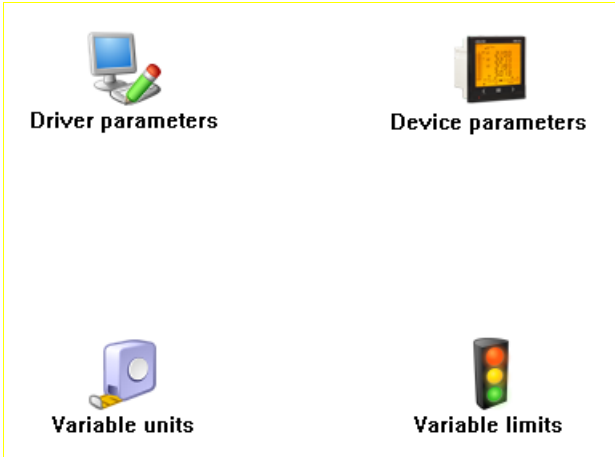
- **Variable**: The parameters associated with the relay are indicated in this field. The output is programmed as an alarm and any of the parameters measured by the CVM-BC can be controlled. The maximum and minimum alarm unit values are indicated in brackets.
- **Max:** In this box the maximum value to control is indicated.
- **Min:** This box indicates the minimum value to be controlled.

- **Delay**: Alarm delay in seconds. The maximum value is 9999 seconds.

1.30.- CVM-C10

1.30.1 Driver options

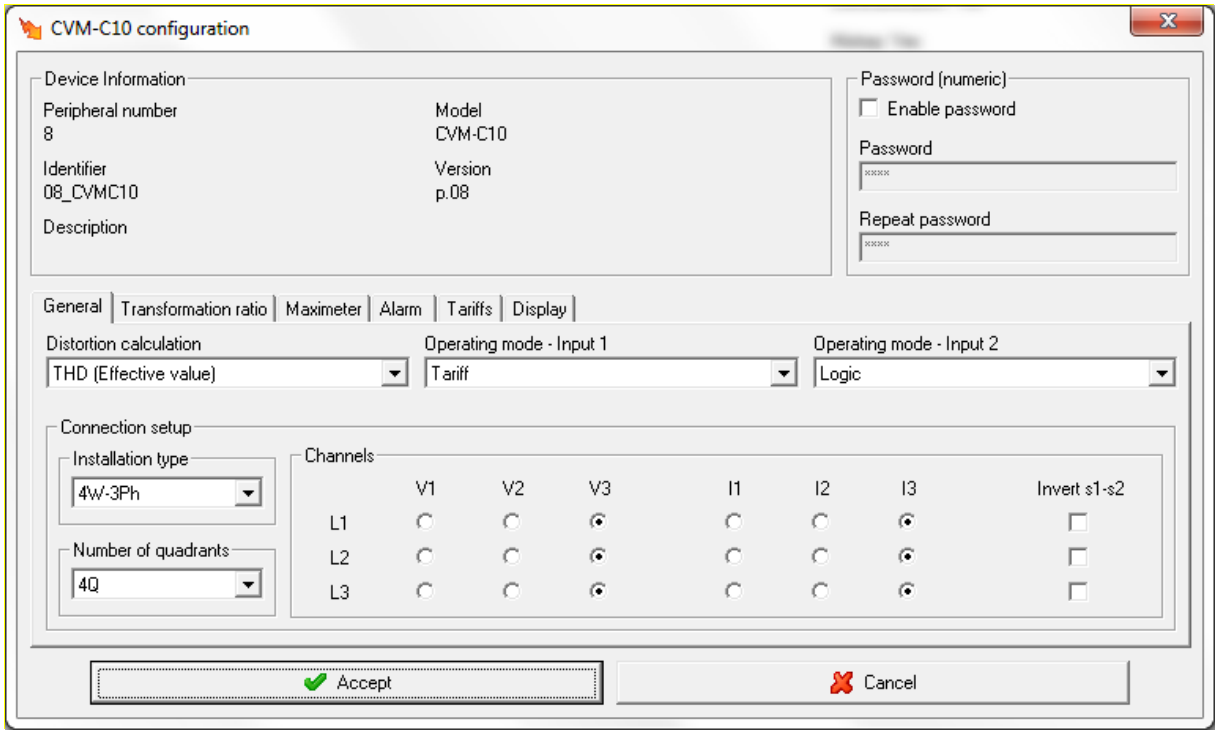
Options menu:

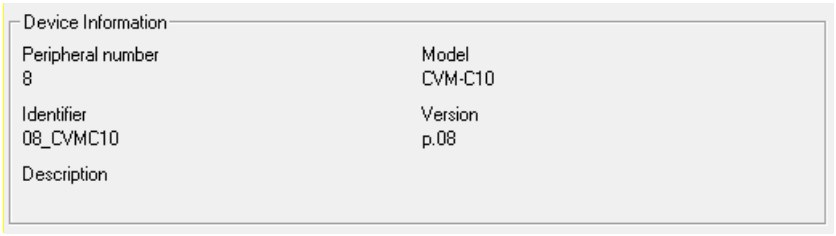


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Unidades de las variables and 1.1.3 Límites de las variables, respectively.

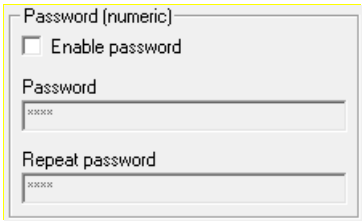
1.30.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. When the dialog box is opened, the software will read the device's configuration. When this procedure is complete, click on '*Accept*' and the software will send the information to the device if any changes have been applied. The information will never be stored on the hard drive of the PC.





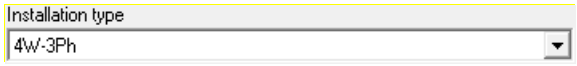
Displays general information.



Activates or deactivates the password to lock the device's keyboard configuration.

In the “General” tab,

This selector configures the type of distortion calculated by the device.



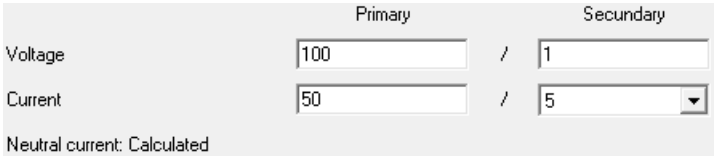
This selector configures the type of distortion calculated by the device.

The device's number of working quadrants can be configured

The operating mode of these inputs can be selected in the inputs mode. It allows you to configure individual inputs in tariff or logical mode.

It also allows you to switch the voltage and current channels and reverse the current direction.

In the “Transformation ratio” tab,



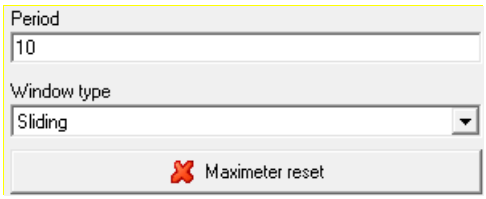
Depending on the version connected, programming of the voltage transformation ratio can be disabled.

- **Voltage transformation ratio:** Primary and secondary voltage programming. The product between the primary value and the primary current must be the same as or less than 20,000,000. The value of the primary, depending on the fullscale of the unit, must be between 1 and the corresponding value from the following table:

Fullscale background	Maximum value.
110V	99.999
250V	70.000
275V	70.000
300V	70.000
500V	40.000

- **Current transformation ratio:** This is the device primary current value. Value may be between 1 and 10,000 A. The secondary current is 5A in the CVM-96.

In the “Maximeter” tab,



- **Period**: This is the maximeter integration period and it can vary between 1 and 60 minutes
- **Window type**: Type of window used to save the maximeter value, which can be fixed or sliding.
- **Maximeter reset:** Press the button to reset the maximeter to zero.

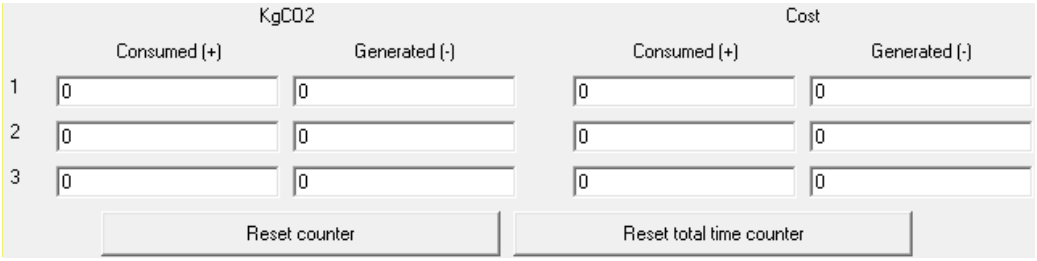
In the “Alarm” tab,

This section shows the configuration of the device's relay outputs, which may be configured with the desired values.

- **Variable**: The parameters associated with the relay are indicated in this field. The output is programmed as an alarm or energy pulse and any of the parameters measured by the device can be controlled. The maximum and minimum alarm unit values are indicated in brackets.

- **Max:** This checkbox shows the maximum value that must be controlled. If an energy variable is selected, the value of each pulse will be indicated.
- **Min:** This checkbox shows the minimum value that must be controlled. If you select an energy variable, this field will remain disabled.
- **Delay**: Alarm delay in seconds after activation. The maximum value is 9999 seconds. This field will be disabled if an energy variable has been selected.
- **Hysteresis**: Tolerance margin during the activation and deactivation of the alarm. The maximum value is 99%. This field will be disabled if an energy variable has been selected.
- **Interlocking**: Configuration of the relay's interlocking when the alarm is activated.
- **Delay off**: Alarm delay in seconds after deactivation. The maximum value is 9999 seconds. This field will be disabled if an energy variable has been selected.
- **Status**: Contact status. The value can be 'Normally open' or 'Normally closed'. This field will be disabled if an energy variable has been selected.

In the "Tariffs" tab



All values entered in the corresponding checkboxes will be loaded when the configuration is sent.

- **Reset meter**: The energy meters will be reset to 0 when you click on this button.
- **Reset total time meter**: The total time meters will be reset to 0 when you click on this button.

In the "Display" tab,

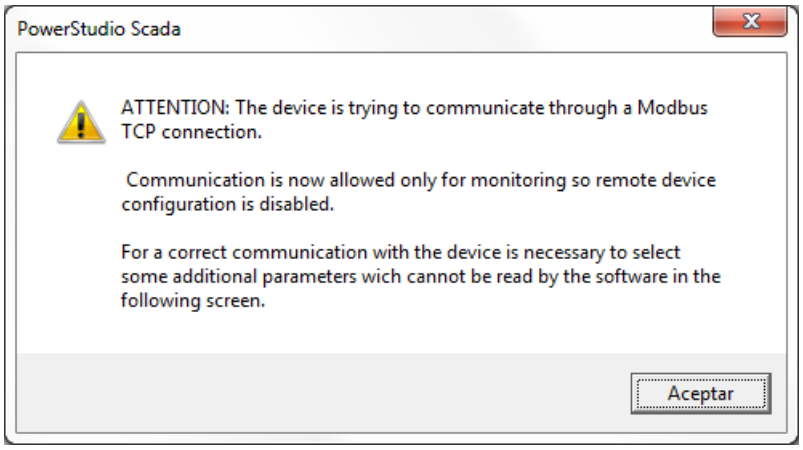
- **Backlight time**: Configuration of the backlight switching-off time. The value should be between 0 and 99 seconds.
- **View harmonics**: Optional display of the harmonics on the device's display.
- **Work profile**: Selection of the desired work profile. Each profile will show determined screens. The screens to be displayed can be selected in the "User" profile.

1.31.- CVM-K

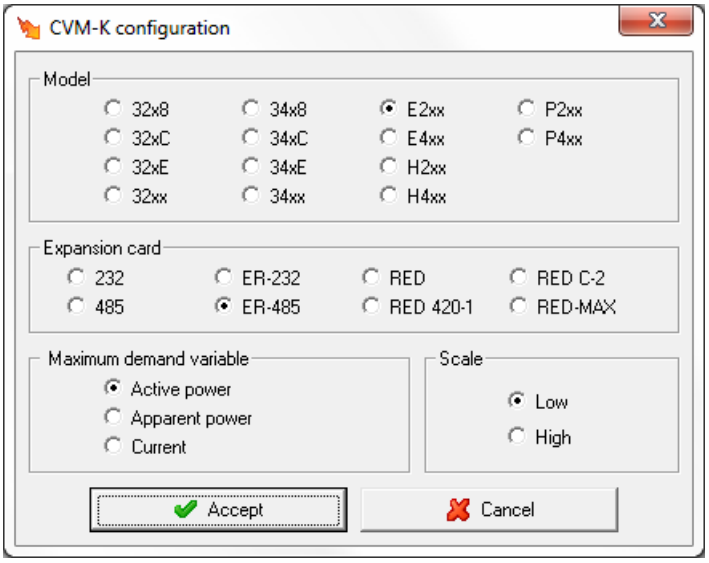
1.31.1 Connection with modbus TCP

The CVM-K devices can connect on MODBUSTCP connections with some limitations. PowerStudio can read the values measured by the device but cannot read the configuration. Although it is not possible to read the configuration, for the correct value display, PowerStudio needs to know certain information about the device. This information should be entered by the user, and it will be the responsibility of the user to ensure that the data corresponds to the device connected. If this data introduced by the user were incorrect it could give communication errors making it impossible for PowerStudio to show the values measured by the device.

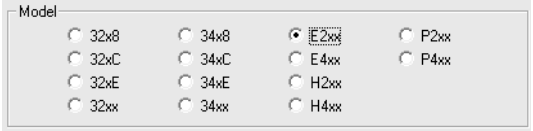
When adding a device on a MODBUSTCP connection, see section 1.20 TCP2RS ModbusTCP converter. PowerStudio displays the following warning:


PowerStudio Scada
ATTENTION: The device is trying to communicate through a Modbus TCP connection.
Communication is now allowed only for monitoring so remote device configuration is disabled.
For a correct communication with the device is necessary to select some additional parameters wich cannot be read by the software in the following screen.
Aceptar

Then a dialogue box will appear with the information PowerStudio needs to communicate with the device.

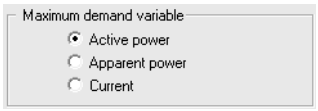


The user must select the correct information corresponding to the device connected.



Device model. Using the model, PowerStudio can determine which variable the device measures and avoid requesting those it does not.

Expansion card.



Variable used to calculate the maximum demand.

Variables measurement scale. This will be used by PowerStudio for the correct display of values shown on screen

1.31.2 Driver options

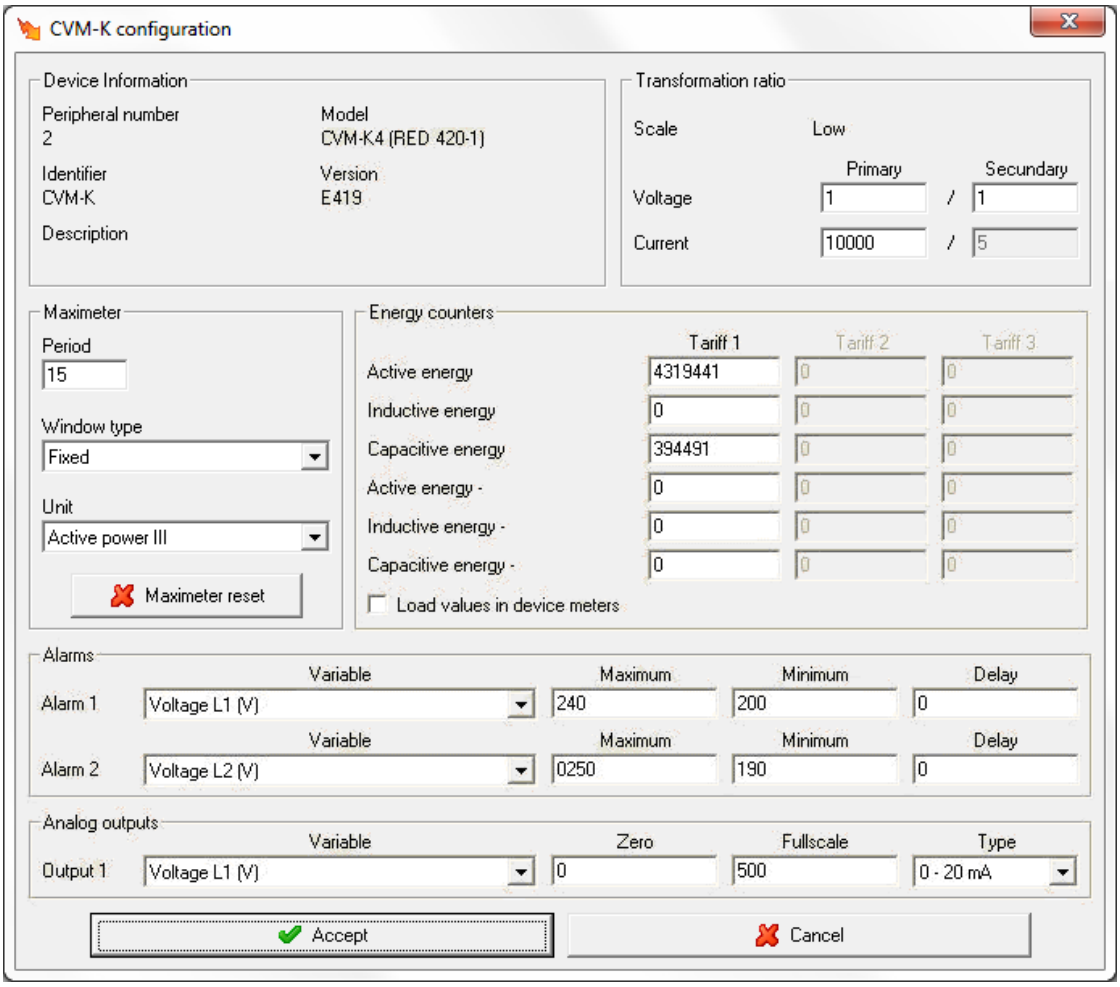
Options menu:

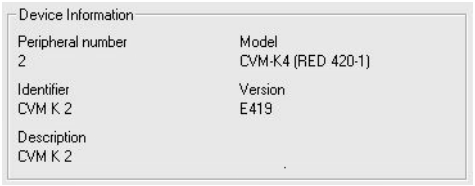
The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.31.2.1 Device parameters

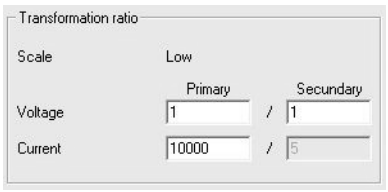
It is not possible to configure the device when it communicates via the MODBUSTCP connection.

This screen allows the internal parameters of the device to be configured. Upon opening the dialogue box, the software will read the device configuration. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.





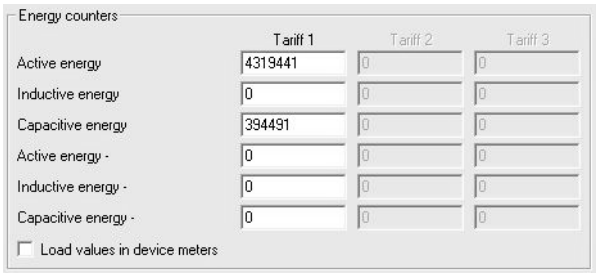
Displays general information.



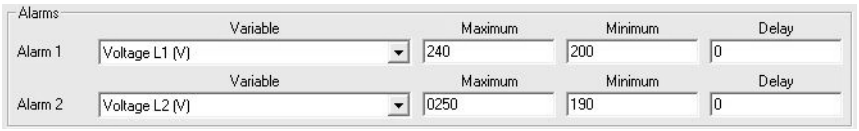
- **Voltage transformation ratio:** Primary and secondary voltage programming. The primary voltage value should be between 1 and 500000 V and the secondary between 1 and 999 V. In addition the primary divided by the secondary must be less than 9090.

- **Primary current transformer:** This is the device primary current value. Value may be between 1 and 10,000 A. Secondary current in the CVM-K is 5A .

- **Period**: This is the maximeter integration period and can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Unit**: Maximum demand can be calculated with active voltage III, apparent voltage III, or current III.
- **Maximeter reset:** Pushing the button resets the maximeter to zero.

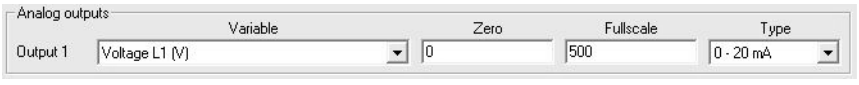


This part of the configuration corresponds to device energies. Depending on the type of device some or all of the fields can be deactivated. If the selector is checked, sending the configuration energy meter will load the energy counter with the values entered into the corresponding boxes.



If the connected device has relay outputs, they can be configured with the values desired.

- **Variable**: Parameter associated to the output relay. The output is programmed as an alarm, controlling any of the parameters measured by the CVM-K. The maximum and minimum alarm unit values are indicated in brackets.
- **Max:** This box indicates the maximum value to be controlled.
- **Min:** This box indicates the minimum value to be controlled.
- **Delay**: Alarm delay in seconds. The maximum value is 9999 seconds.



If the device has analogue outputs, the desired values can be configured.

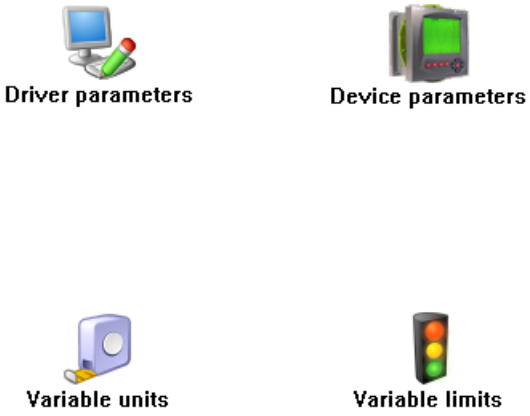
- **Variable**: Parameter associated to the analogue output. Any parameter measured by the CVM-K can be selected as an analogue output.
- **Zero:** Value of the parameter to which the zero of the scale is assigned.

- **Fullscale:** Value of the parameter to which maximum value of the scale is assigned.
- **Type:** Type of input, permits either 0-20 mA or 4-20 mA to be chosen.

1.32.- CVM-K2

1.32.1 Driver options

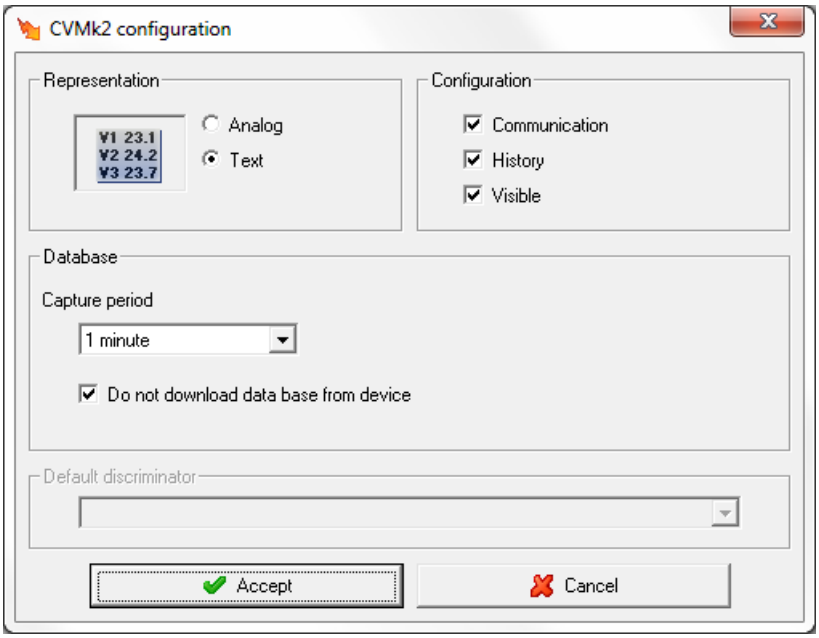
Options menu:



The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

The "*Expansion Card*" options will depend on the expansion card inserted in the device.

1.32.1.1 Driver Parameters

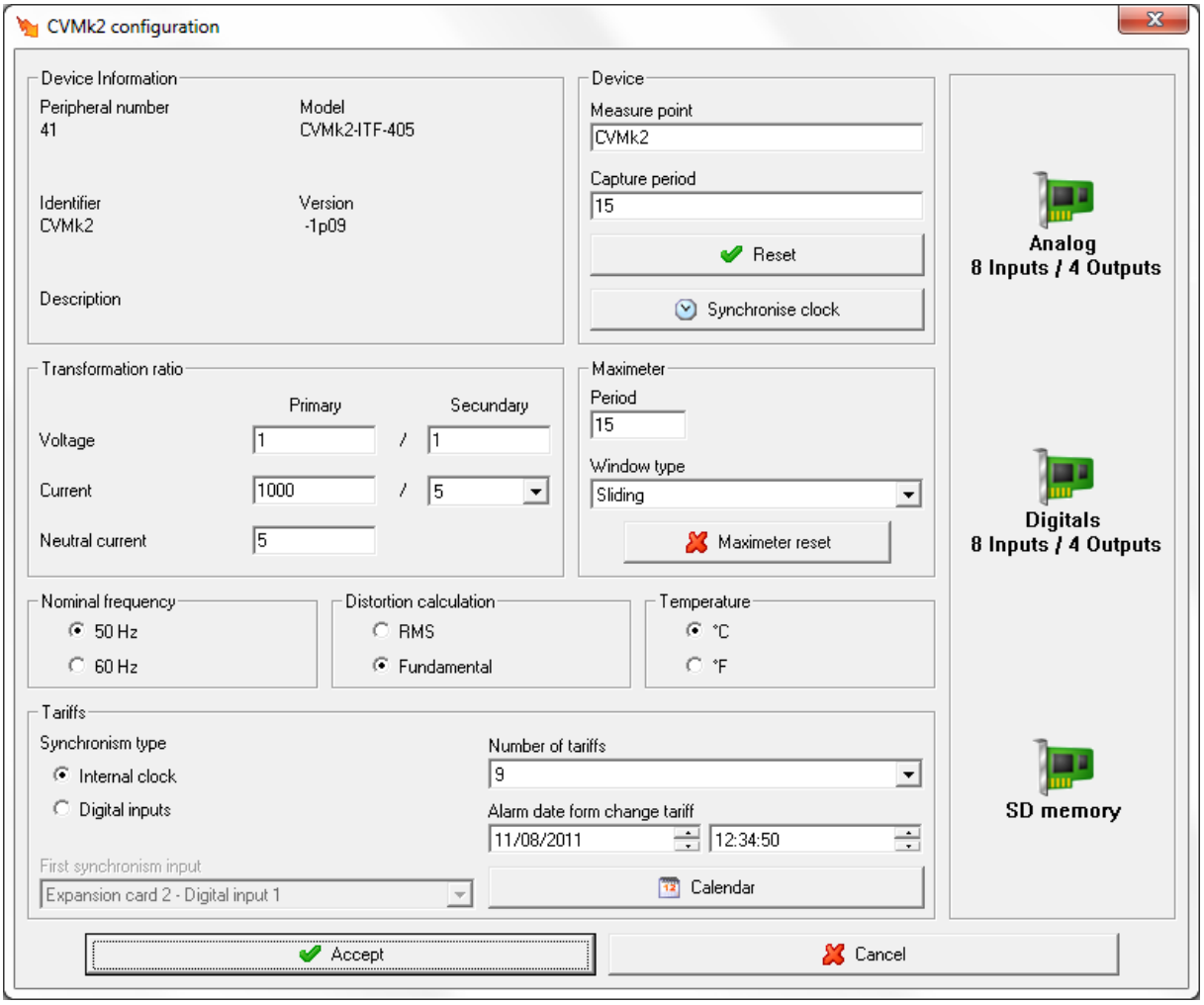


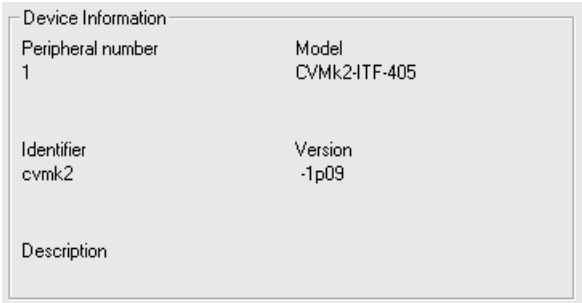
For the device driver, CVMK2 has added an option to disable downloading of the database generated by the equipment. If this option is chosen the instantaneous data file will not download from the equipment, nor will EVQ files or SD cards exist. The remaining screen parameters are detailed in section 1.1.1 Driver parameters.

When the device has an '*SD Memory*' expansion card inserted, the data capture period is configured using the "*Device parameters*" option.

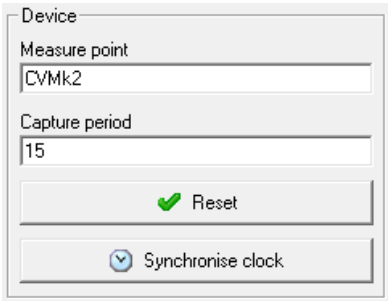
1.32.1.2 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "*Accept*" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

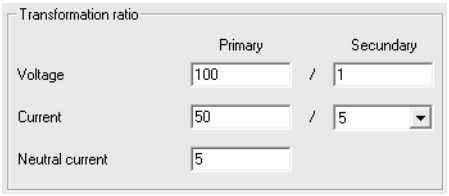




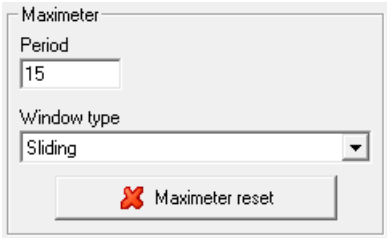
Displays general information.



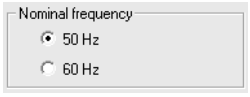
- **Measuring point:** Short description of the device for display and better identification on the device screen.
- **Capture period:** Data capture period, in minutes, for generation of log values when the equipment has an expansion card inserted in the memory.
- **Initialise energy meters:** Click to reset the energy device meters
- **Synchronise clock:** Click to synchronise device date and time to the PC date and time.



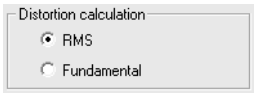
Programming the device voltage transformation ratios, current and neutral current.



- **Period**: Maximeter integration period, which can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Maximeter reset:** Pushing the button resets the maximeter to zero.

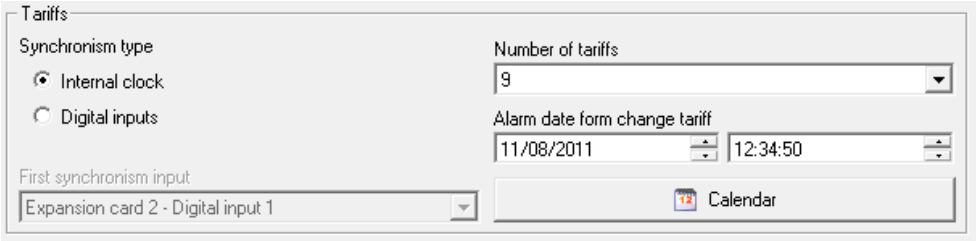


Device nominal operating frequency configuration.



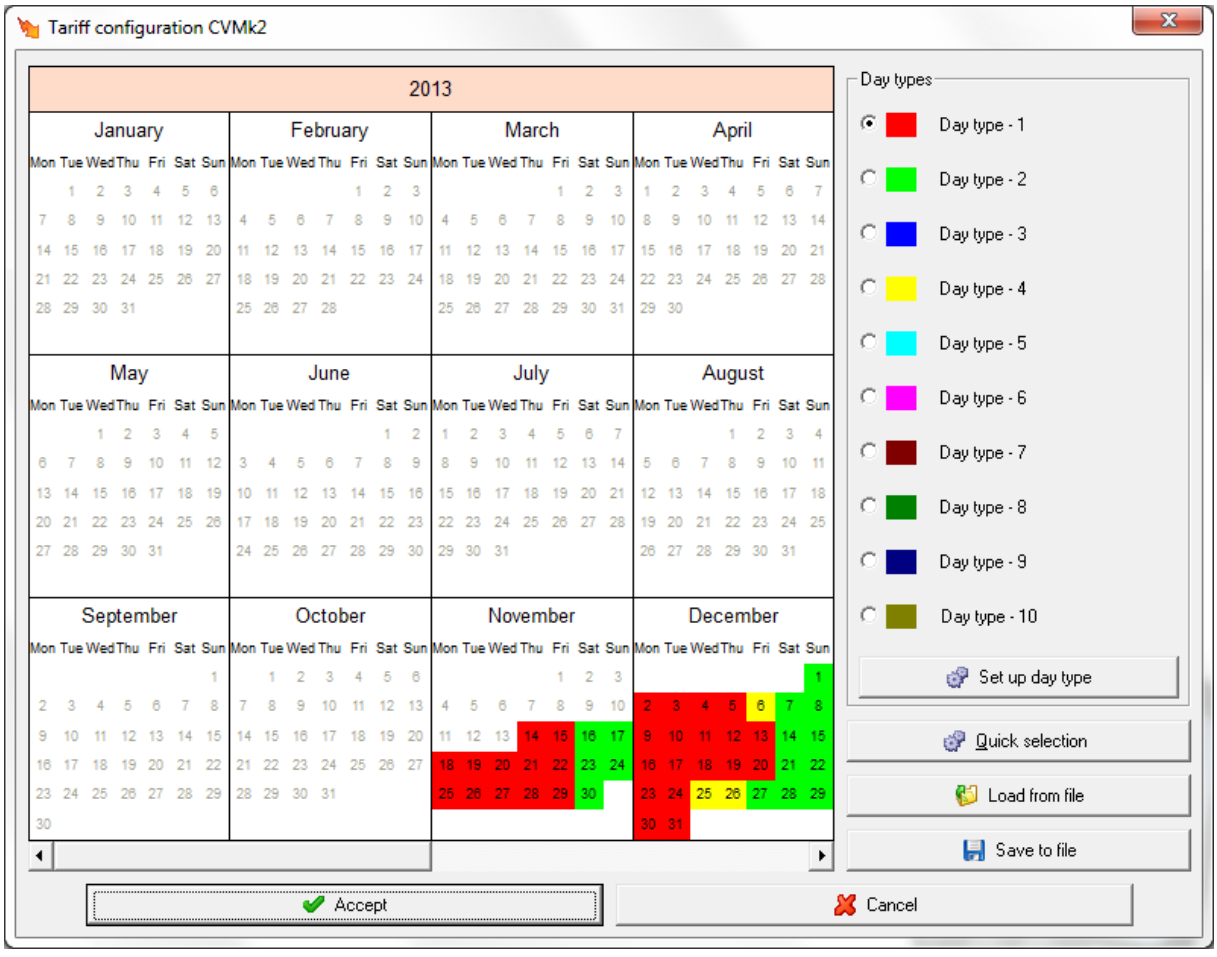
Use this selector to configure the type of distortion the device will calculate.

Device measured temperature value units configuration.



Device tariff configuration.

- **Synchronisation type:** Tells device to whether to synchronise tariffs by its *internal clock*, by the configured calendar, or by *digital Input* from an external device. The digital input type is only allowed when the device has digital input expansion cards.
- **First synchronisation input:** Only if the synchronisation type is by digital inputs. Select the digital input that corresponds to tariff 1.
- **Number of tariffs:** The quantity of tariffs that the device will use must be indicated.
- **Tariff change alarm date:** Only if synchronisation is by internal clock. Indicate a date that the alarm will sound when a tariff change is due.
- **Calendar** Only if synchronisation is by internal clock. Allows configuration of the tariff calendar by which the device will be governed.

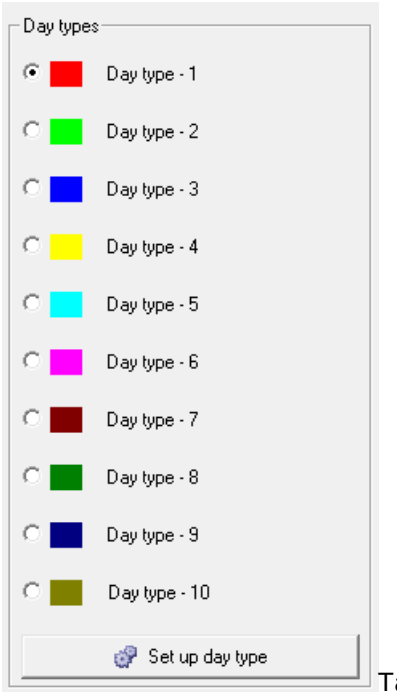


Here the configured device tariff calendar is shown. Each calendar day is colour coded by day type.

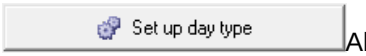
The device can only be configured for 365 days a year from the current date. For this reason the image begins on June 3, 2008 and ends on June 2, 2009. For example, if October 1st is configured as type 1 (red), as long as no calendar configuration changes are made, October 1st of every year will be type 1.

Day selection is done as follows:

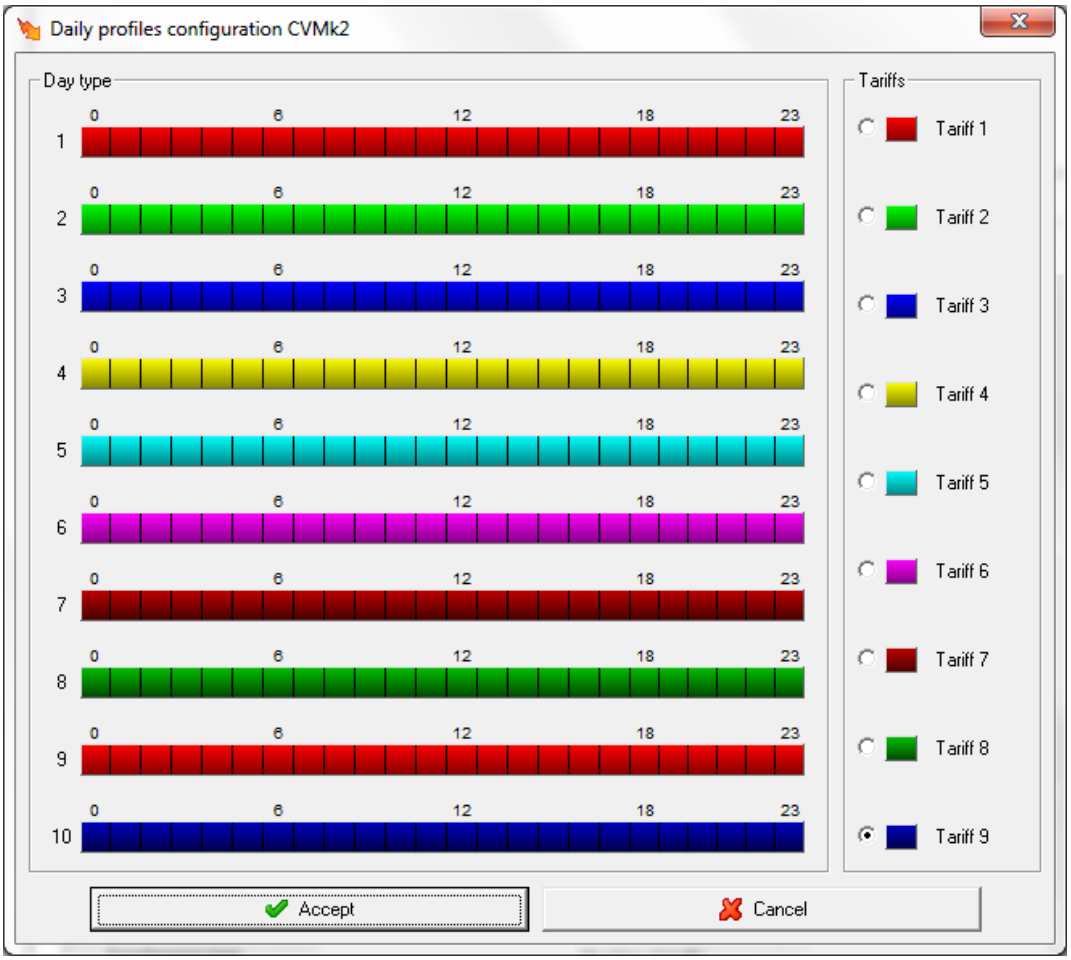
- Left click a day to select it.
- Left click a start date, hold down the SHIFT key, then left click an end date to choose every date in between.
- Use the quick selection option.



Tariff day type. Allows a day of the week to be assigned to the different tariff calendar days. Left click a schedule day to assign the corresponding day of the week.



Allows day of the week to be indicated. Click the button and the following dialogue box appears.

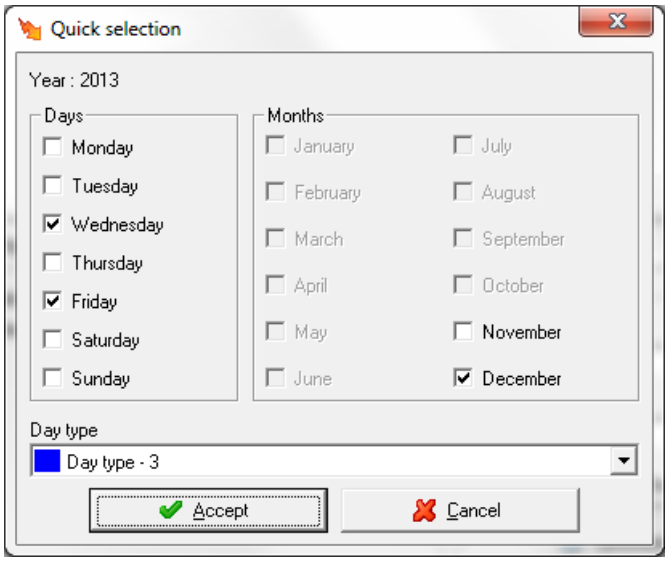


The section on the left displays the different day types divided into one hour strips; on the right you can select the tariff you would like to apply to the day type.

To assign a tariff to a day of the week, first select the desired tariff, then proceed as follows:

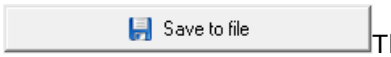
- Clicking the left mouse button on one of the type of day sections, marking only the section selected.
- Left click a start section, hold down the SHIFT key, then left click an end section to select all sections in-between. The initial and final sections must both correspond to the same type of day.

with this option, selections may be made automatically. The following dialogue box will appear.



In this case every Wednesday and Friday of December is marked as day type 3.

Allows the calendar configuration and types of day to be loaded from a file previously saved on a disk. This option is useful when it is necessary to configure the same timetable on multiple devices.



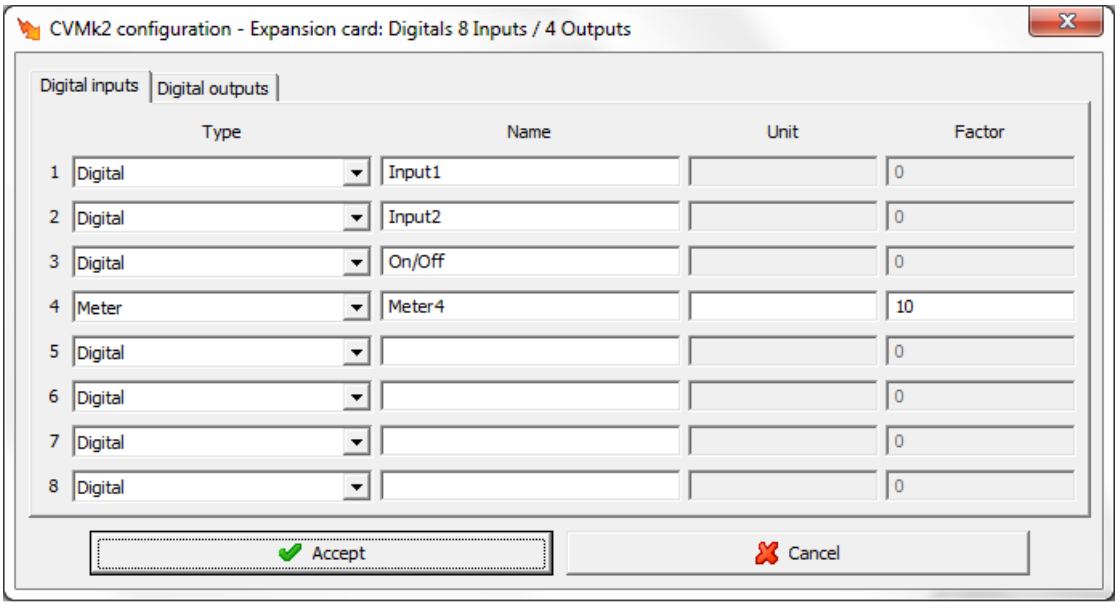
The calendar configuration and the types of day can be stored on a disk, and can be loaded on another device.

1.32.1.3 Expansion Cards

Configuration options may or may not appear according to the number and type of expansion cards in the device.

1.32.1.3.1 Digital input / output

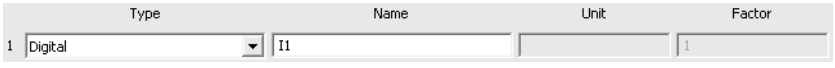
> Depending on the card model, the number of inputs and outputs may vary.



Use to switch between card input and output configuration. The previous image shows configuration of the digital inputs.

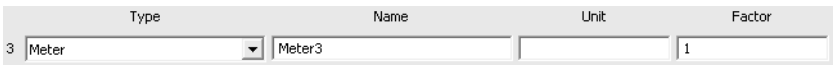
Each of the digital inputs may be configured as a digital input and therefore the status of the input can be monitored (open or closed) or used as a meter, counting the number of pulses that occur in the digital input.

Configuring the input as digital:



- **Type:** The type should be selected as digital.
- **Name:** Alphanumeric data type for the identification of the digital input on the device display.

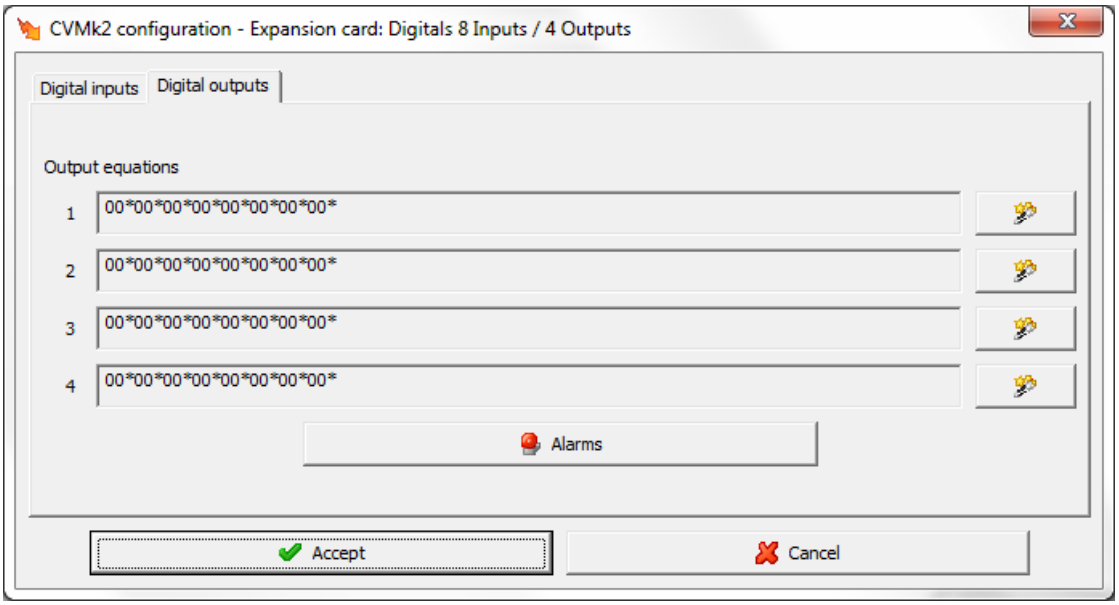
Otherwise it will be configured as a meter



- **Type:** The type must be set to meter.
- **Name:** Alphanumeric type data to identity the meter on the device display.

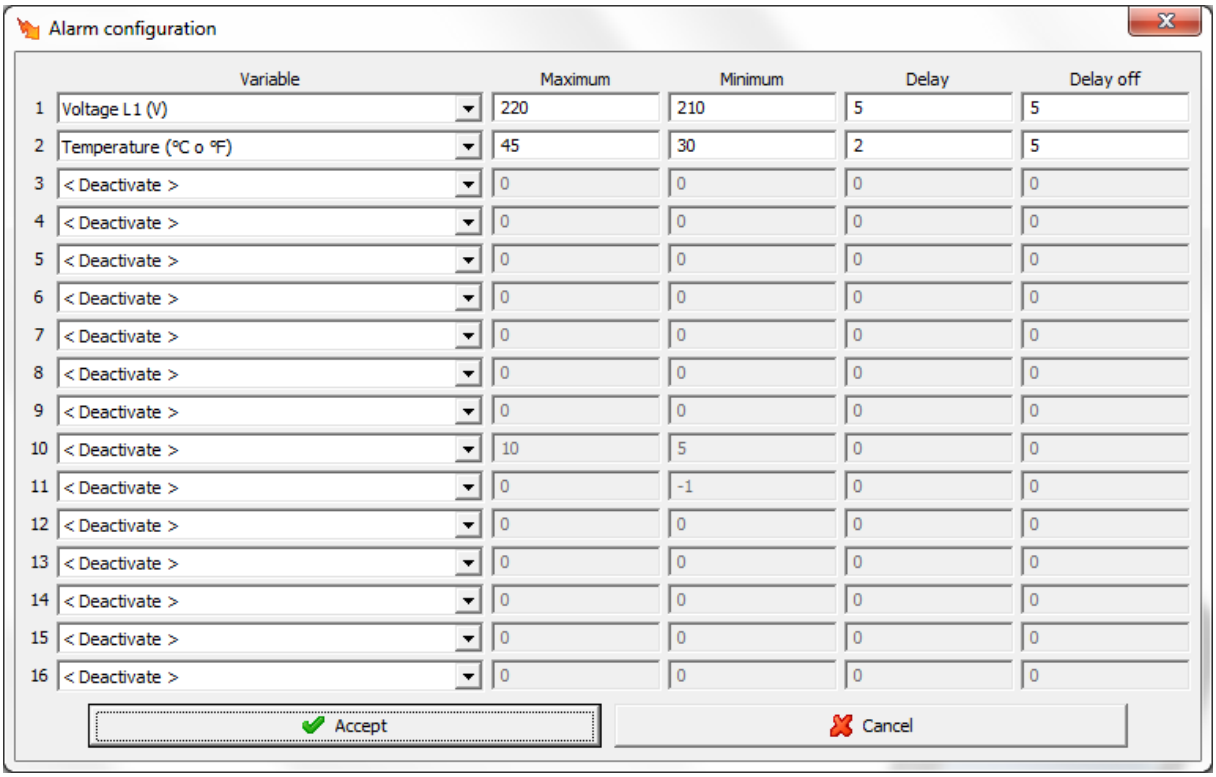
- **Unit:** Alphanumeric type data to indicate that this meter is active.
- **Factor:** Multiplier value for each pulse detected at the input.

Configure digital outputs as follows:



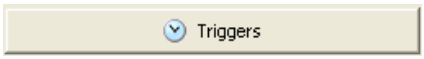
Here an output equation is defined for each outputs. This output equation corresponds to a conditional expression to decide when the device should act on the digital output depending on the alarms configured.

Configuration of alarms for use in the output equation. Click the button and the following dialogue box appears.

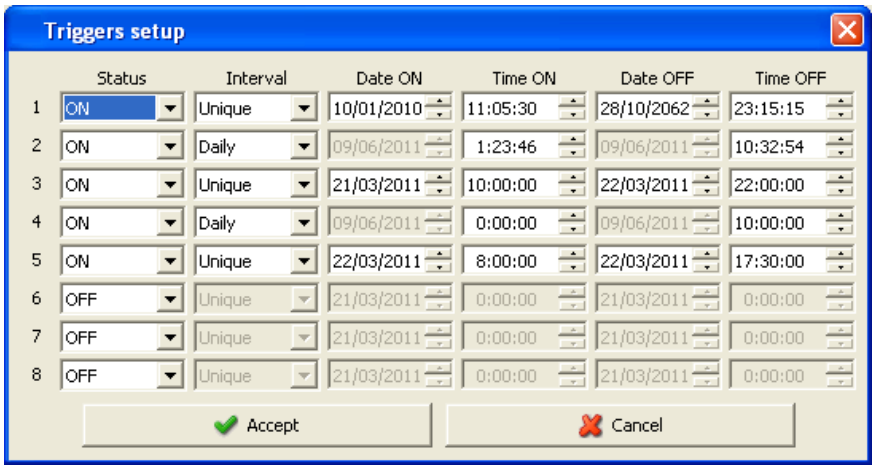


Here the 16 device alarms can be configured:

- **Variable:** In this field, select the parameter associated with the alarm; any of the parameters measured by the device can be selected. The maximum and minimum alarm unit values are indicated in brackets.
- **Max:** The maximum value to control is configured. The range allowed depends on the selected variable.
- **Min:** The minimum value to control is configured. The range allowed depends on the selected variable.
- **Delay:** Alarm delay in seconds after activation.
- **Delay off:** Alarm delay in seconds after deactivation.



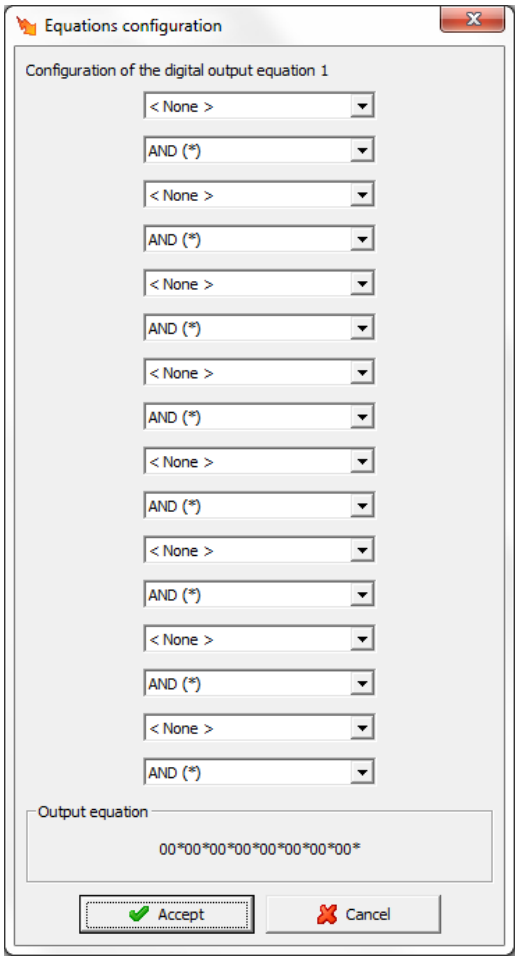
Configuration of triggers by date and time for use in the output. Click the button and the following dialogue box appears.



If the trigger condition is fulfilled, the digital output is enabled, otherwise it is disabled.

The trigger may be unique (fulfilled on one occasion) or daily (fulfilled every day). There will be as many triggers as digital outputs.

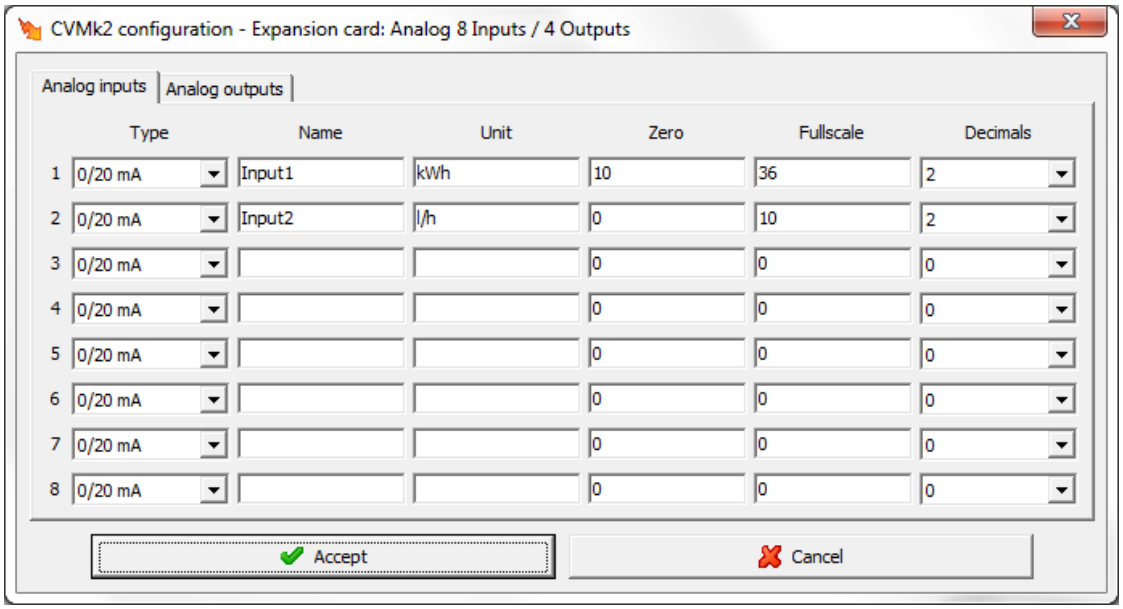
Allows output equations to be configured. Click the button and the following dialogue box appears.



Where the alarm and the operation to be carried out can be selected alternately (AND or OR). To obtain more information on the operation of the digital output equations consult the device manual.

1.32.1.3.2 Analogue inputs and outputs

Depending on the card model, the number of inputs and outputs may vary.

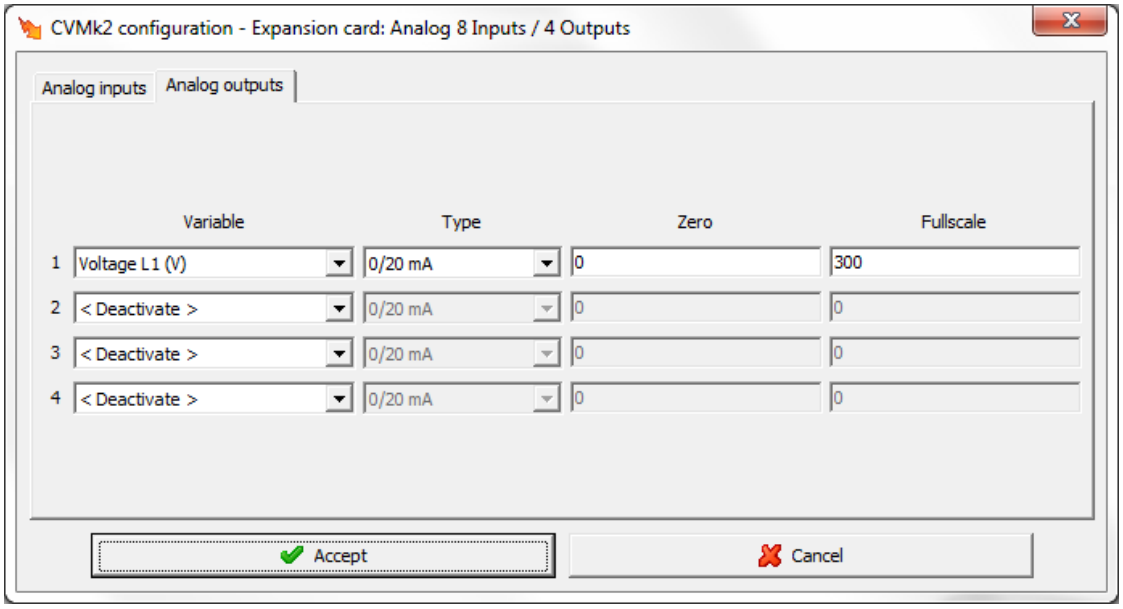


Use Analog inputs | Analog outputs to switch between input and output configuration. The previous image shows configuration of the analogue inputs.

For each of the analogue inputs the following can be configured:

- **Type:** Enables selection of the different input signal types accepted by the device.
- **Name:** A brief description of the analogue input for its identification on the device screen.
- **Unit:** A brief description of the analogue input measurement units for display on the device screen.
- **Zero:** Value of the parameter to which the zero of the scale is assigned.
- **Fullscale:** Value of the parameter to which the maximum value of the scale is assigned.
- **Decimals:** Number of decimals of the value measured by the analogue input.

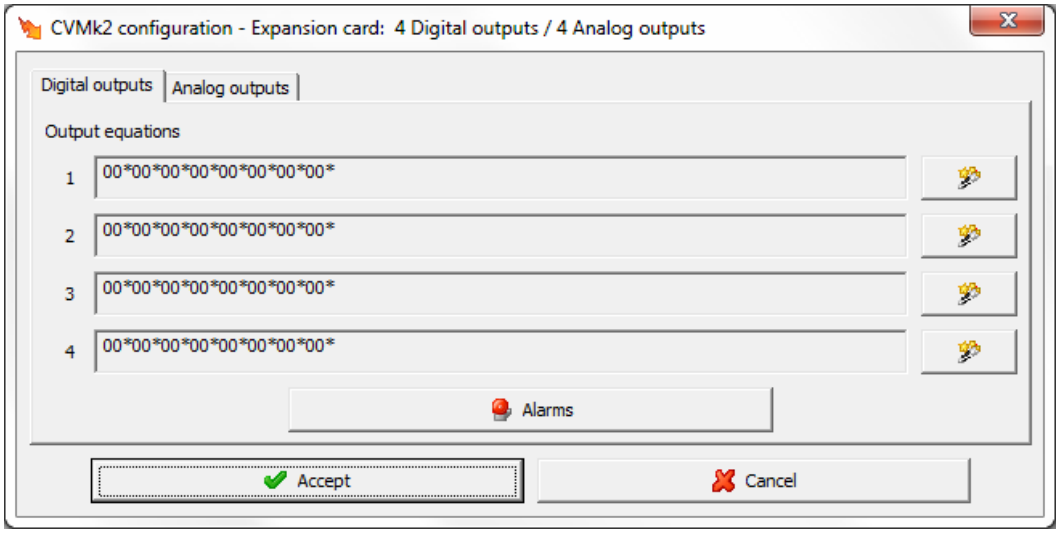
Analogue output configuration is shown in the following image:



For each of the analogue inputs the following can be configured:

- **Variable:** Permits any parameter the device measures for analogue outputs to be selected
- **Type:** Allows selection of the different output types the device can generate.
- **Zero:** Value of the parameter to which the zero of the scale is assigned.
- **Fullscale:** Value of the parameter to which the maximum value of the scale is assigned.

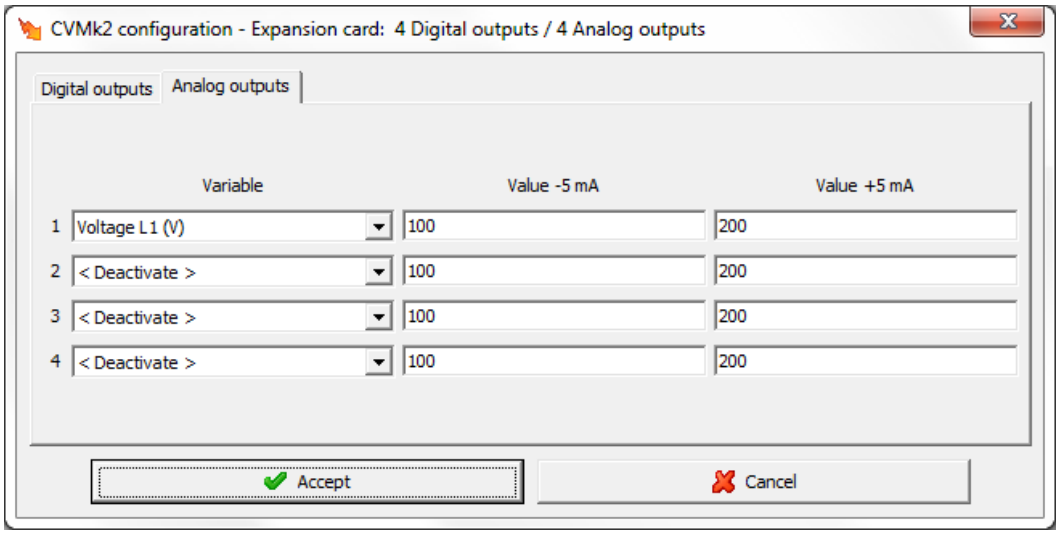
1.32.1.3.3 4 digital outputs / 4 analogue outputs



Use to switch between configuring analogue and digital card outputs. In the previous image the configuration of the digital outputs can be seen.

For more information on configuring the digital outputs consult the section 1.32.1.3.1 Digital input / output.

Analogue output configuration is shown in the following image:

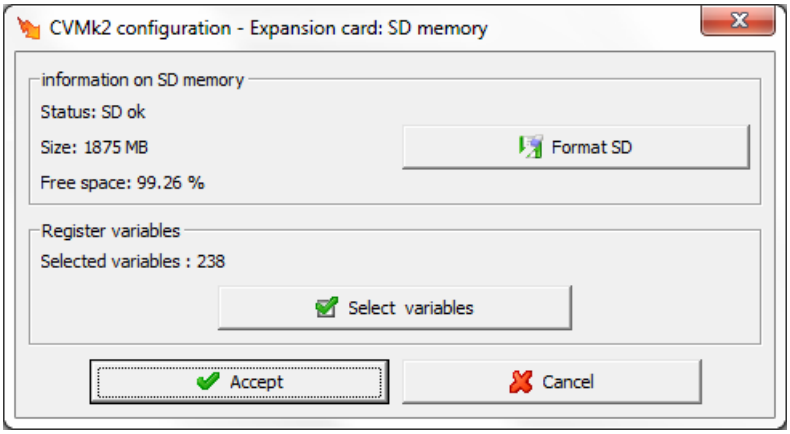


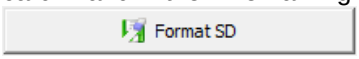
For each of the analogue inputs the following can be configured:

- **Variable:** Permits any parameter the device measures for analogue outputs to be selected
- **Value -5 mA:** Value of the parameter which is assigned to the -5 mA output.
- **Value +5 mA:** Value of the parameter which is assigned to the + 5 mA output.

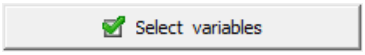
1.32.1.3.4 SD Memory

If the device has an SD Memory expansion memory, but the SD memory is not inserted, the data measured is not stored in memory or by the software.

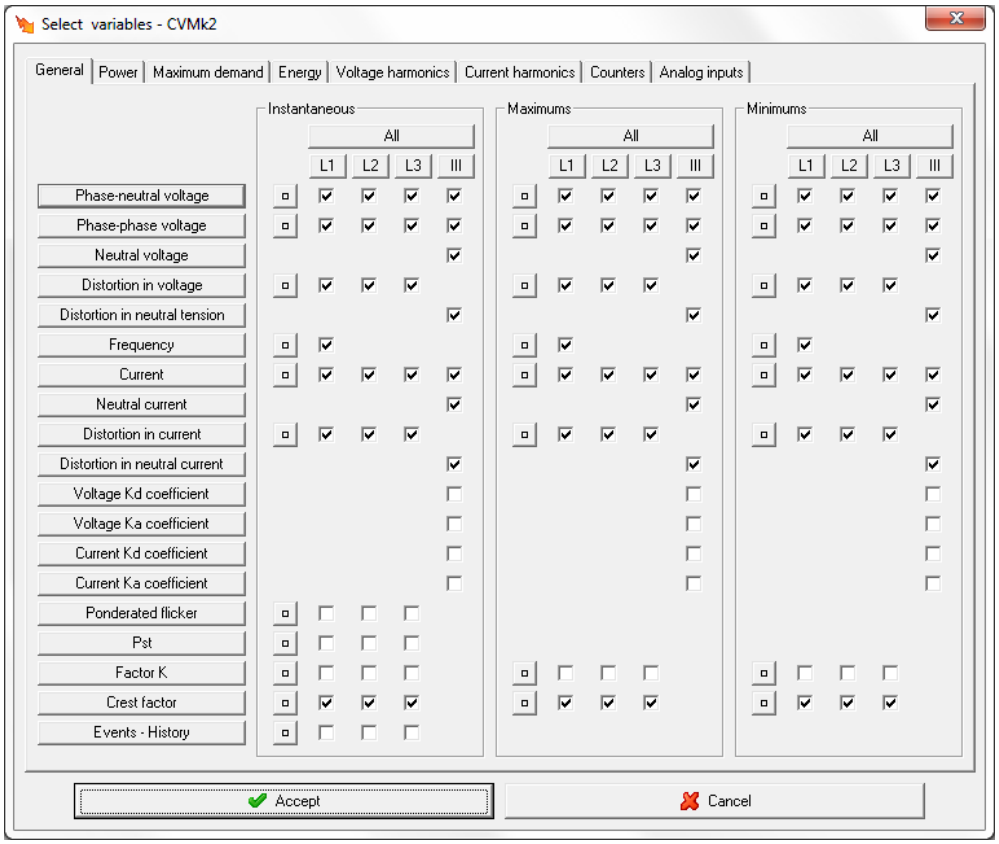


On the upper part of the dialogue box, information is shown about the SD Memory inserted into the device. It shows information such as the status, with which it is possible to know if the card works correctly, or if there are any problems, for example, if it is protected from overwriting, the size of the card and the remaining free space. It is also possible by clicking the button 

to format the SD card. Remember that formatting the card will erase all data not downloaded by means of the software.

The number of variables that the device saves in the log is shown on the lower part. Click the button 

to select the variables that the device will save.



1.33.- CVM-K HAR

1.33.1 Connection with modbus TCP

The CVM-K HAR devices can connect on MODBUSTCP connections with some limitations. PowerStudio can read the values measured by the device but cannot read the configuration.

By adding a device on a MODBUSTCP connection, see section 1.20 TCP2RS ModbusTCP converter. PowerStudio displays the following warning:

PowerStudio Scada
ATTENTION: The device is trying to communicate through a Modbus TCP connection.
Communication is now allowed only for monitoring so remote device configuration is disabled.
Aceptar

1.33.2 Driver options

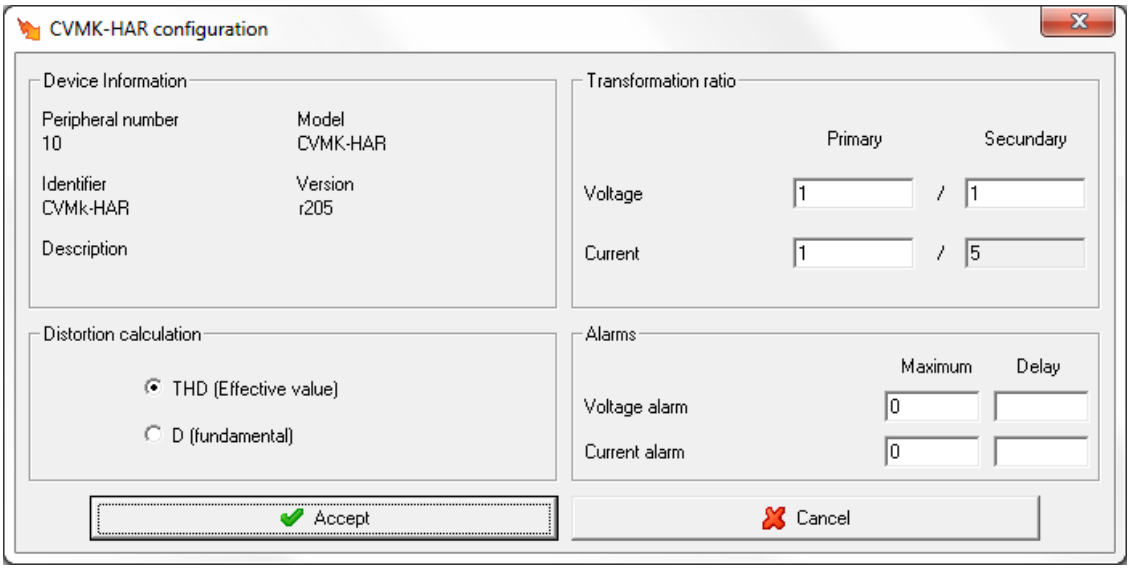
Options menu:

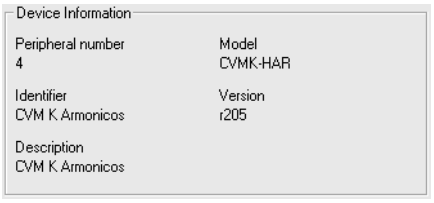
The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.33.2.1 Device parameters

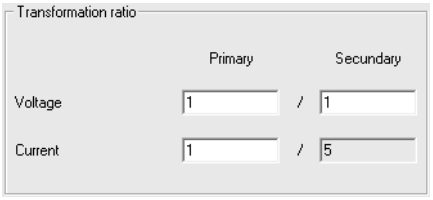
It is not possible to configure the device when it communicates via the MODBUSTCP connection.

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.





Displays general information.



- **Voltage transformation ratio:** Primary and secondary voltage programming. The primary voltage value should be between 1 and 999999 V and the secondary between 1 and 999 V. The product of the primary value and the primary current must be the same as or less than 20,000,000.

- **Current transformer primary:** This is the device primary current value. Value may be between 1 and 10000 A. The secondary current is 5A in the CVM-K HAR.

Use this selector to configure the type of distortion the device will calculate.

Should an additional module with two relay outputs be available, it can be configured as an alarm mode with the THD or D variables on voltage and on current.

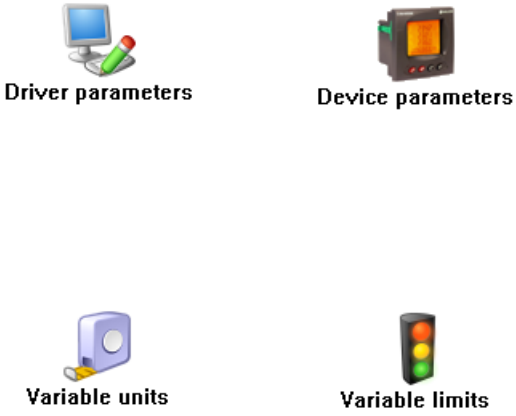
Maximum value. When the value read by the CVM-K HAR device exceeds the programd value, the device will close the contact corresponding to the programd alarm. This maximum programd value will be a % of THD or D.

Delay, both on the connection and disconnection of the alarm relay. This value will be expressed in seconds.

1.34.- CVM-MINI , CVM NRG-96 and CVM-NET

1.34.1 Driver options

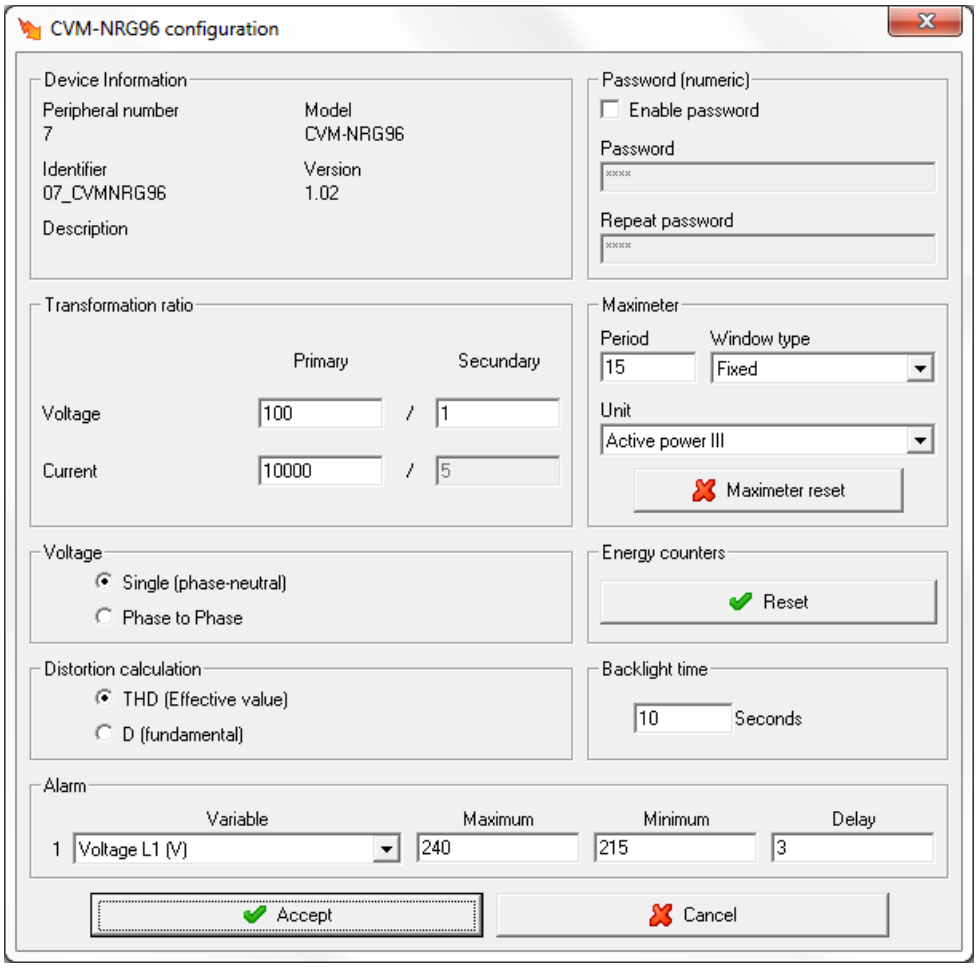
Options menu:

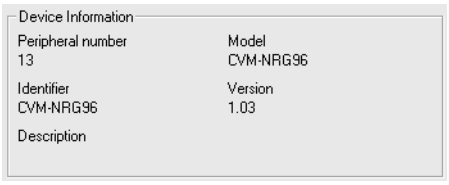


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

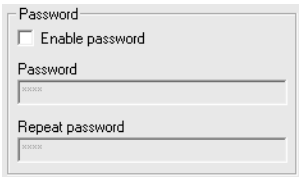
1.34.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

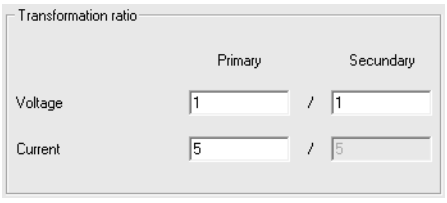




Shows general information.



Enables the password to be enabled or deactivated to block the configuration of the device by means of the keyboard.

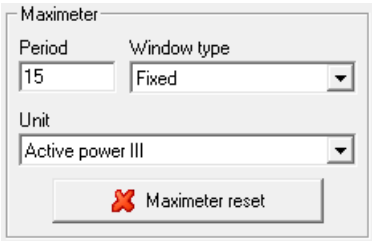


Depending on the version connected, programming of the voltage transformation ratio can be disabled.

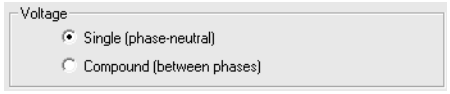
- **Voltage transformation ratio:** Primary and secondary voltage programming. The product of the primary value and the primary current must be the same as or less than 20,000,000. The value of the primary, depending on the fullscale of the equipment, must be between 1 and the corresponding value from the following table:

Full-scale	Maximum value.
110V	99.999
250V	70.000
275V	70.000
300V	70.000
500V	40.000

- **Current transformation ratio:** This is the device primary current value. Value may be between 1 and 10,000 A. The secondary current is 5A in the CVM-96.

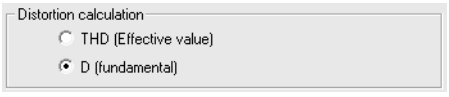


- **Period:** This is the maximeter integration period and can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Unit**: The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- **Maximeter reset:** When the button is pressed, the device maximeter resets to zero.



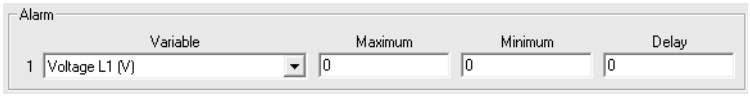
Selecting the type of voltage calculated.

Configuration of the "*backlight*" disconnection. The value should be between 0 and 99 seconds.



Use this selector to configure the type of distortion the device will calculate.

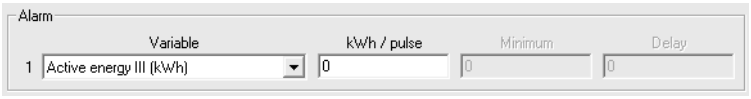
On clicking the button the energy counters on the device will reset to zero.



This section shows the configuration of the device relay output and the option to configure it with the desired values is given.For CVM-MINI devices the two relay outputs of these devices can be configured.

- **Variable:** The parameters associated with the relay are indicated in this field. The output is programd as an alarm or energy pulse with any of the parameters measured by the device being able to be controlled. The maximum and minimum alarm unit values are indicated in brackets.

- **Max:** This box indicates the maximum value to be controlled.If an energy variable is selected, the value of each pulse will be indicated. This will be displayed as follows:



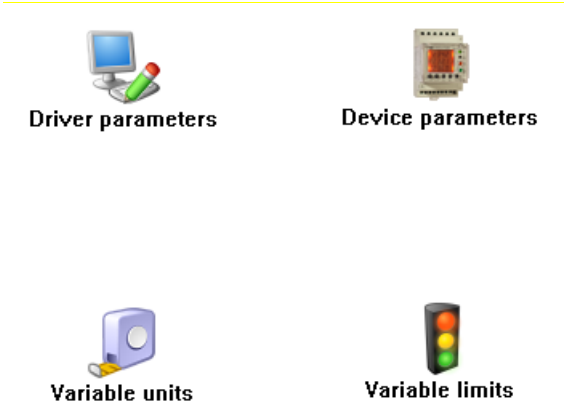
- **Min:** This box indicates the minimum value to be controlled.If you select an energy variable, this field will remain disabled.

- **Delay:** Alarm delay in seconds. The maximum value is 9999 seconds.This field will remain deactivated if an energy variable is chosen.

1.35.- CVM-MINI Ethernet

1.35.1 Driver options

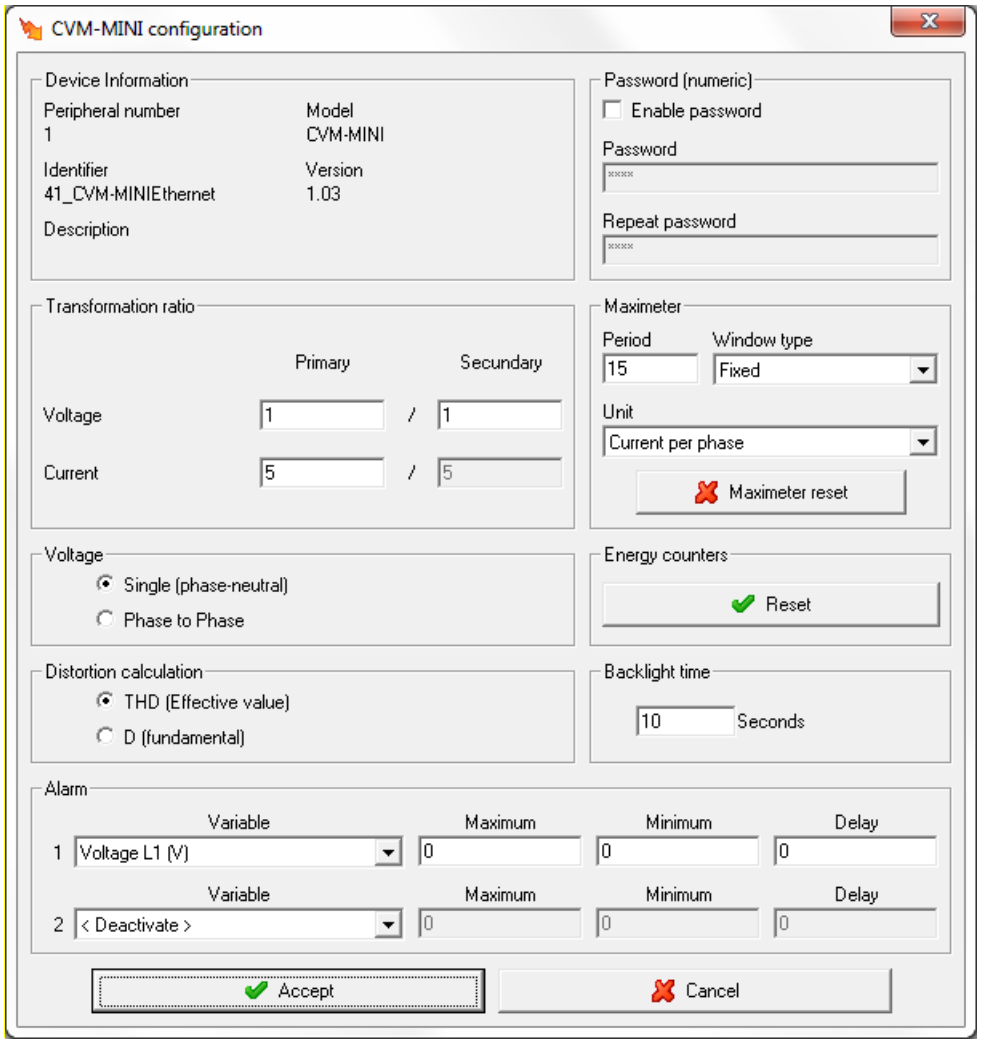
Options menu:

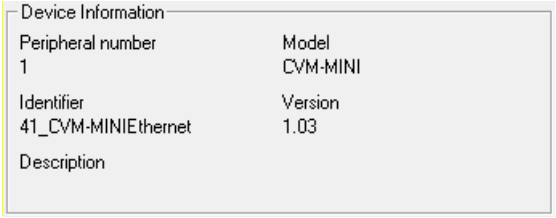


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

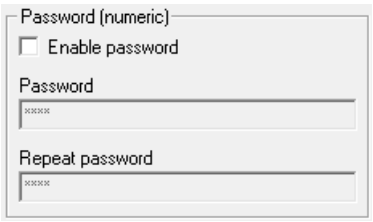
1.35.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. When the dialog box is opened, the software will read the device's configuration. When this procedure is complete, click on '*Accept*' and the software will send the information to the device if any changes have been applied. The information will never be stored on the hard drive of the PC.

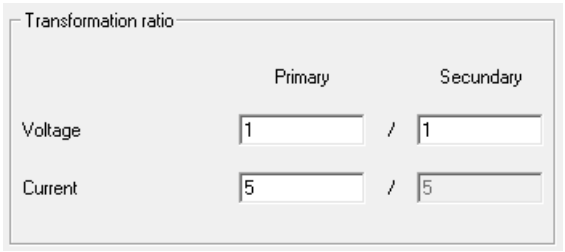




Displays general information.



Activates or deactivates the password to lock the device's keyboard configuration.

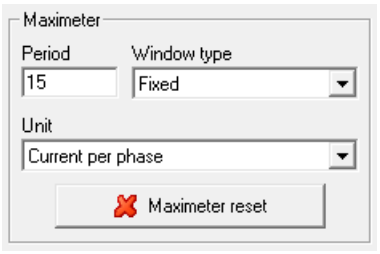


Depending on the version connected, programming of the voltage transformation ratio can be disabled.

- **Voltage transformation ratio:** Primary and secondary voltage programming. The product between the primary value and the primary current must be the same as or less than 20,000,000. The value of the primary, depending on the fullscale of the unit, must be between 1 and the corresponding value from the following table:

Fullscale background	Maximum value.
110V	99.999
250V	70.000
275V	70.000
300V	70.000
500V	40.000

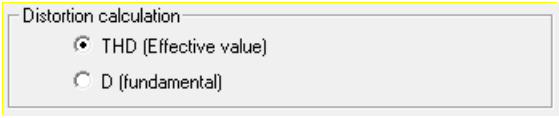
- **Current transformation ratio:** This is the device primary current value. Value may be between 1 and 10,000 A. The secondary current is 5A in the CVM-96.



- **Period**: Maximeter integration period, which can vary between 1 and 60 minutes.
- **Window type**: Type of window used to save the maximeter value, which can be fixed or sliding.
- **Unit**: The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- **Maximeter reset:** Press the button to reset the maximeter to zero.

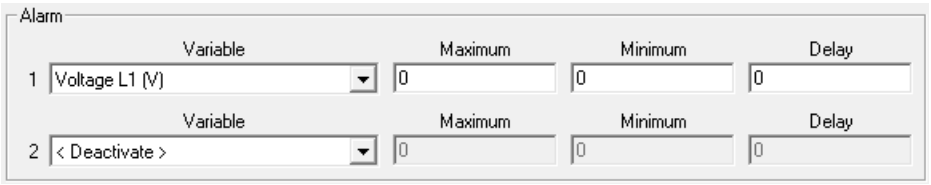
Selecting the type of voltage calculated.

Configuration of the "*backlight*" disconnection. The value should be between 0 and 99 seconds.



This selector configures the type of distortion calculated by the device.

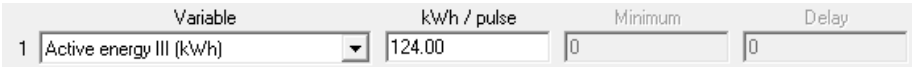
Clicking the button will reset the energy meters on the device to zero.



This section shows the configuration of the two relay outputs of the device , which may be configured with the desired values.

- **Variable**: The parameters associated with the relay are indicated in this field. The output is programmed as an alarm or energy pulse and any of the parameters measured by the device can be controlled. The maximum and minimum alarm unit values are indicated in brackets.

- **Max:** This checkbox shows the maximum value that must be controlled. If an energy variable is selected, the value of each pulse will be indicated. It will be displayed as follows:



- **Min:** This checkbox shows the minimum value that must be controlled. If you select an energy variable, this field will remain disabled.

- **Delay**: Alarm delay in seconds. The maximum value is 9999 seconds. This field will be disabled if an energy variable has been selected.

1.36.- CVM-NET4

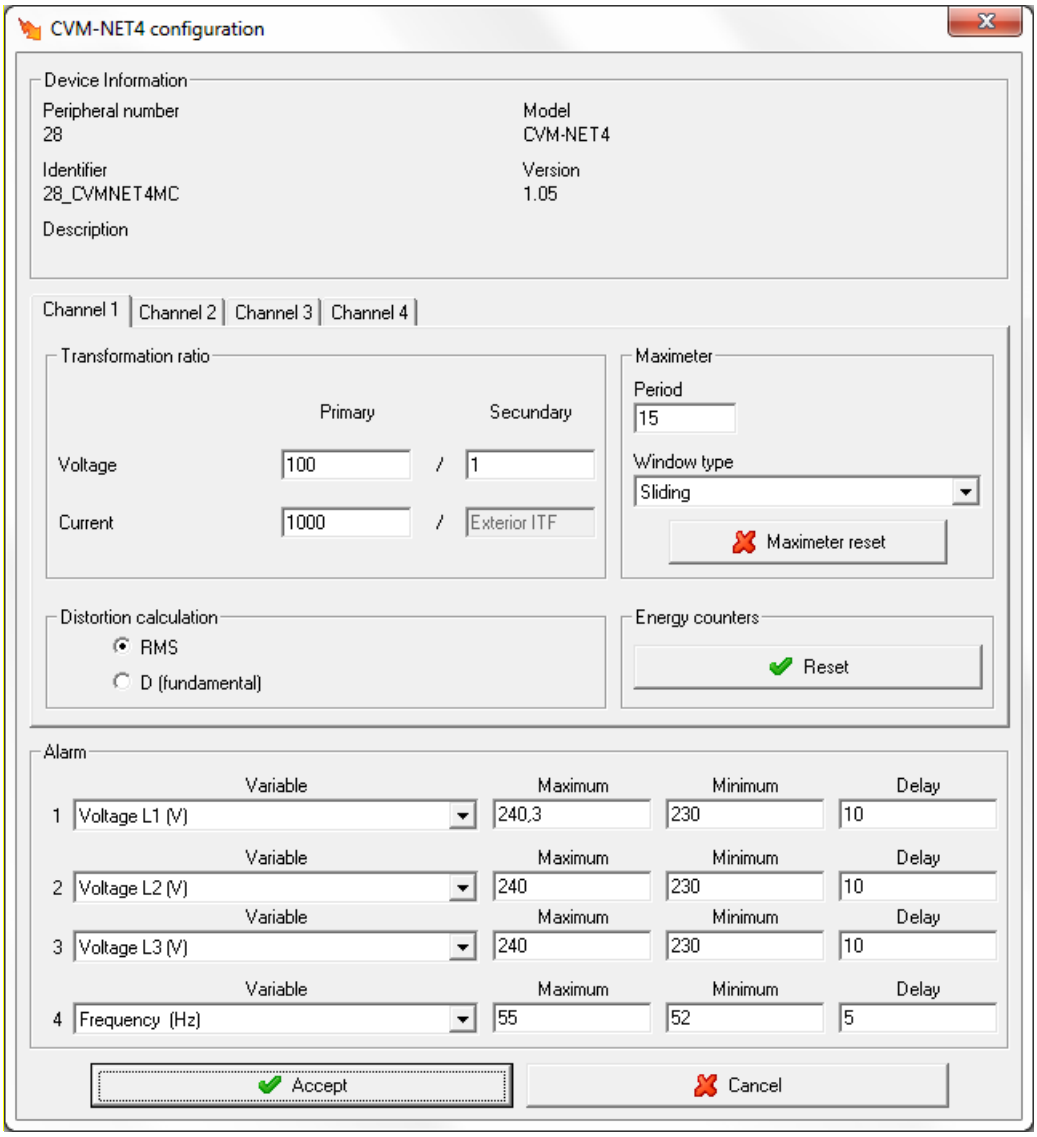
1.36.1 Driver options

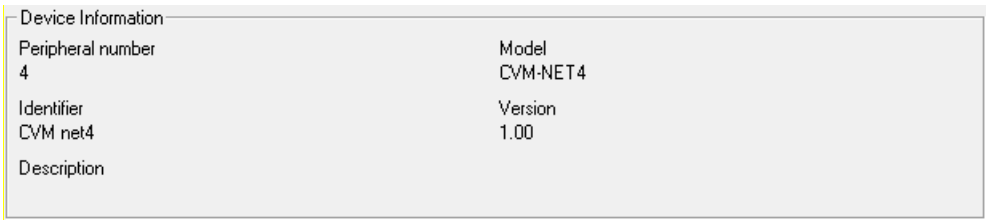
The device options are as follows:

The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

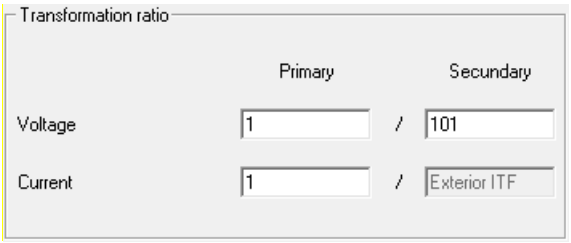
1.36.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. When the dialog box is opened, the software will read the device's configuration. When this procedure is complete, click on '*Accept*' and the software will send the information to the device if any changes have been applied. The information will never be stored on the hard drive of the PC.





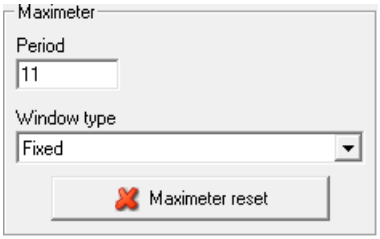
Displays general information.



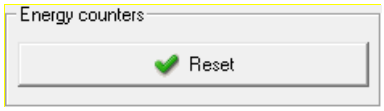
- **Voltage transformation ratio:** Shows the ratio between the primary and secondary voltage programmed in the device.

- **Power transformation ratio:** Shows the primary to secondary current ratio programmed in the device.

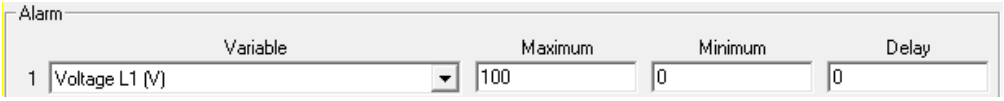
This selector configures the type of distortion calculated by the device.



- **Period**: This is the maximeter integration period and it can vary between 1 and 60 minutes
- **Window type**: Type of window used to save the maximeter value, which can be fixed or sliding.
- **Maximeter reset:** Press the button to reset the maximeter to zero.

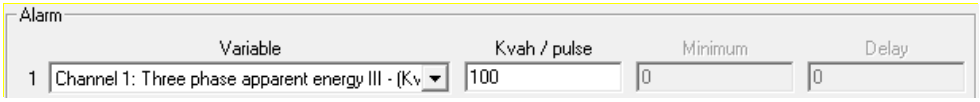


Clicking this button will reset the energy meter to zero.



This section shows the configuration of the device's relay output and the option to configure it with the desired values is given. The four relay outputs of CVM-NET4 devices can be configured.

- **Variable**: The parameters associated with the relay are indicated in this field. The output is programmed as an alarm or energy pulse and any of the parameters measured by the device can be controlled. The maximum and minimum alarm unit values are indicated in brackets.
- **Max:** This checkbox shows the maximum value that must be controlled. If an energy variable is selected, the value of each pulse will be indicated. This will be displayed as follows:



- **Min:** This checkbox shows the minimum value that must be controlled. If you select an energy variable, this field will remain disabled.
- **Delay**: Alarm delay in seconds. The maximum value is 9999 seconds. This field will be disabled if an energy variable has been selected.

1.37.- CVM-R8

Communication will not be possible with the CVM-R8 through a MODBUSTCP connection.

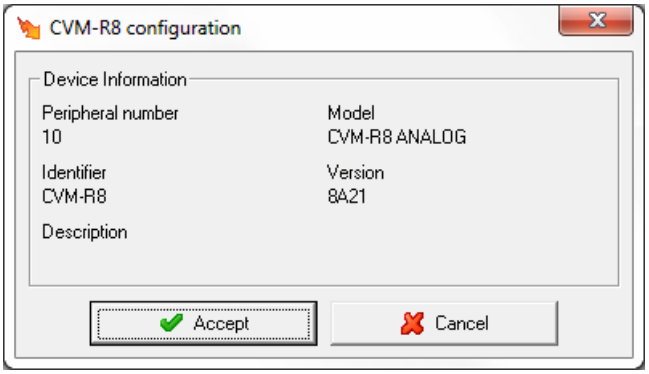
1.37.1 Driver options

The following is the options menu:

The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

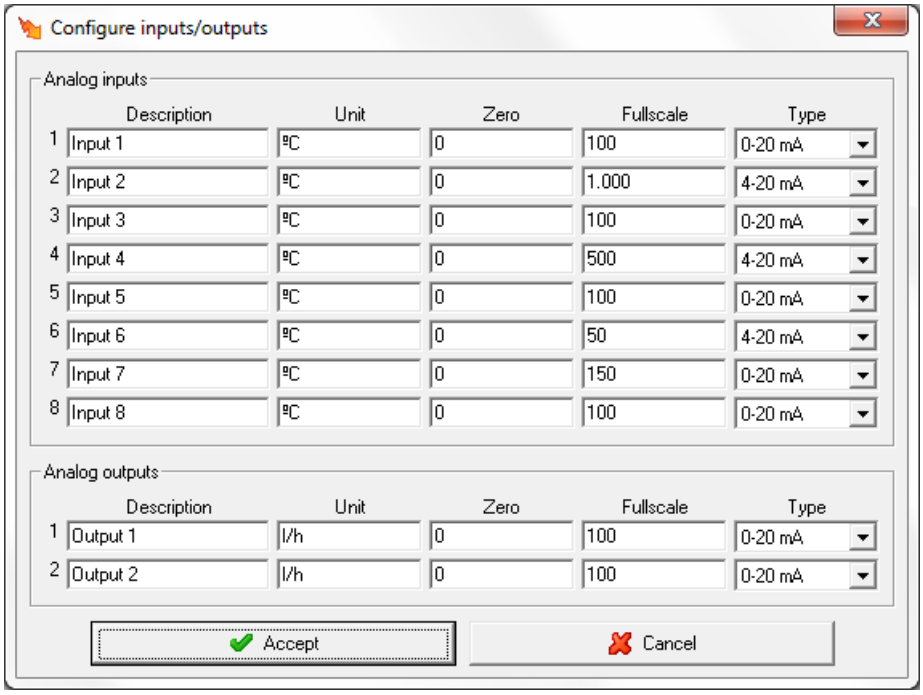
1.37.1.1 Device parameters

In the case of CVM-R8 it will not be possible to configure any parameters of the device; it will only be possible to show information about it.



1.37.1.2 Analogue inputs and outputs

From this dialogue the analogue inputs on the CVM-R8 devices with analogue inputs and/or outputs can be configured.



- **Description:** Alphanumeric type information which enables a brief description to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units to be entered.
- **Zero:** Value of the parameter to which the zero of the scale is assigned.
- **Fullscale:** Value of the parameter to which the maximum value of the scale is assigned.
- **Type:** Type of entry, allows between 0-20 mA, 4-20 mA or 0 -? to be chosen V

1.37.1.3 Variable limits

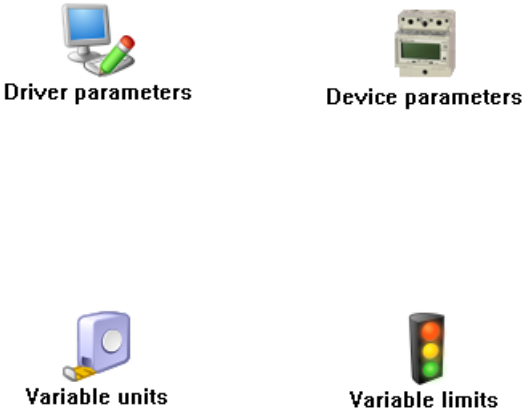
Only for CVM-R8 devices with analogue inputs.

This option has been detailed in section 1.1.3 Variable limits.

1.38.- CVM-SP

1.38.1 Driver options

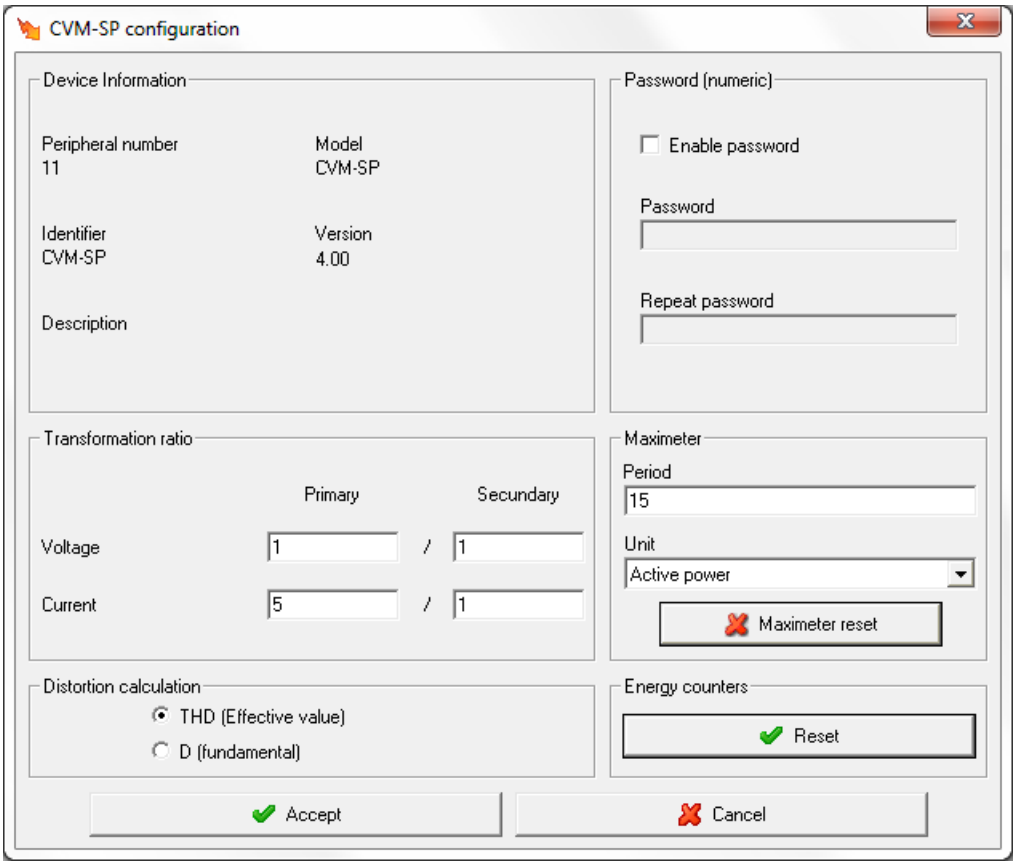
Options menu:

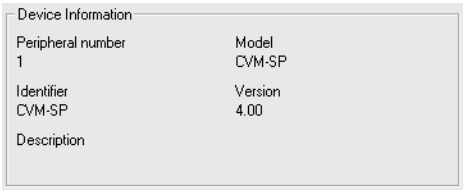


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

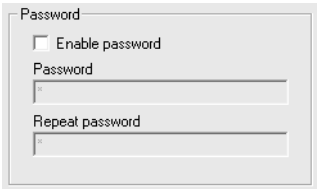
1.38.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

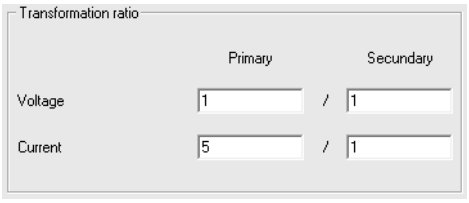




Shows general information.



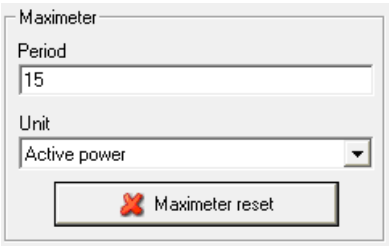
Enables the password to be enabled or deactivated to block the configuration of the device by means of the keyboard.



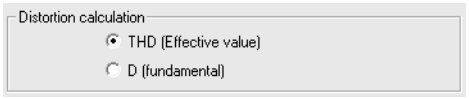
- **Voltage transformation ratio:** Primary and secondary voltage programming. The product of the primary value and the primary current must be the same as or less than 20,000,000. The primary value, depending on fullscale, must be between 1 and the value of the following table:

Full-scale	Maximum value.
110v	99.999
275v	70.000
300v	70.000
500v	40.000

- **Current transformation ratio:** This is the device primary current value. Value may be between 1 and 10,000 A. The secondary current is 5A in the CVM-144.



- **Period:** This is the maximeter integration period and can vary between 1 and 60 minutes.
- **Unit**: The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- **Maximeter reset:** When the button is pressed, the device maximeter resets to zero.



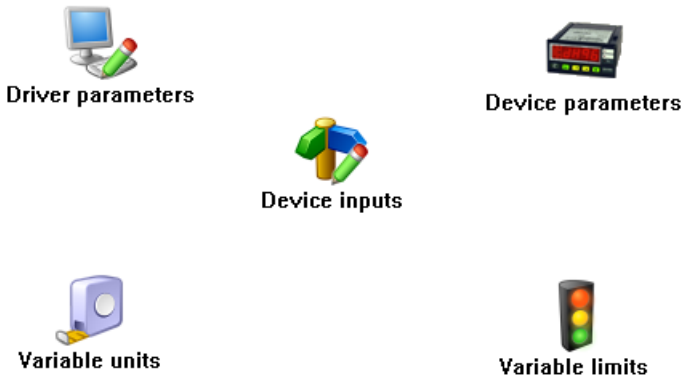
Use this selector to configure the type of distortion the device will calculate.

On clicking the button the energy counters on the device will reset to zero.

1.39.- DH-96

1.39.1 Driver options

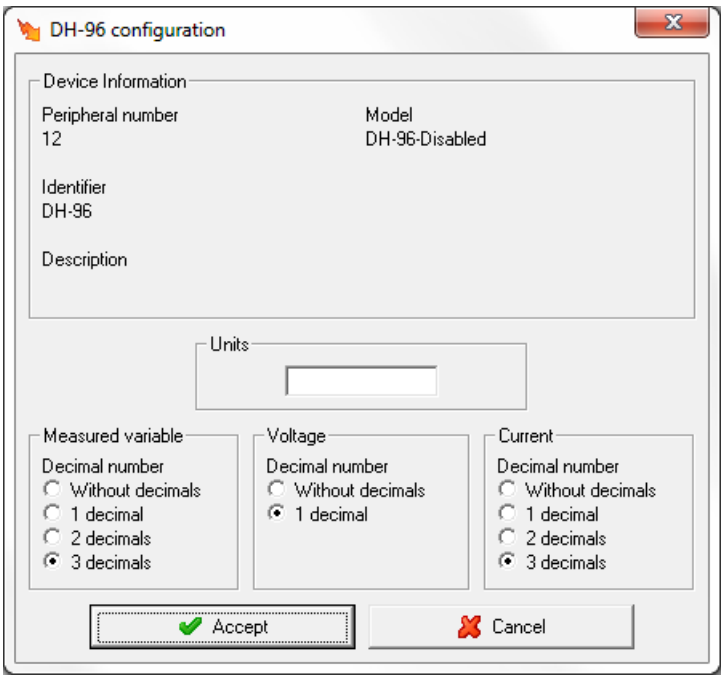
Options menu:

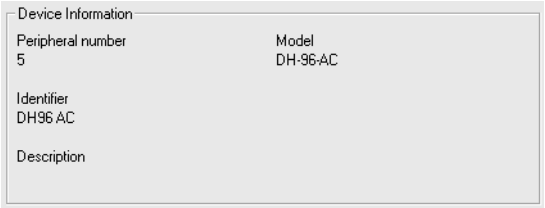


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively. The *'Device inputs'* option only appears on DH-96 CT and DH-96 CPP devices.

1.39.1.1 Device parameters

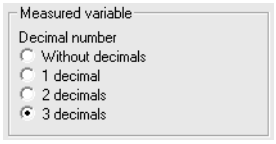
On DH-96 devices it will not be possible to modify internal parameters; they must be changed manually using the device keyboard. For more information on how to modify the parameters see the manual that comes with the device.



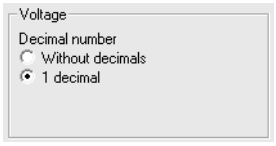


Shows general information.

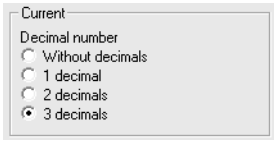
Alphanumeric type data which permits a brief description of the DH-96 units of measurement to be entered. These units will be displayed in the data display, in no event will they be sent to the device. 1.33.2.2 This parameter will not appear on DH-96 CT units, on the DH-96 CT equipment a brief description of the units can be entered on the input screen, 3.25.1.2 InputInputss.



Only for DH-96 AC, DH-96 CT, DH-96 DC, DH-96 WG, DH-96 CPP equipment. The number of decimal places used when displaying the variable measured on the equipment can be configured. This parameter will be used solely as information on your computer, and at no time will it be sent or read by the equipment.

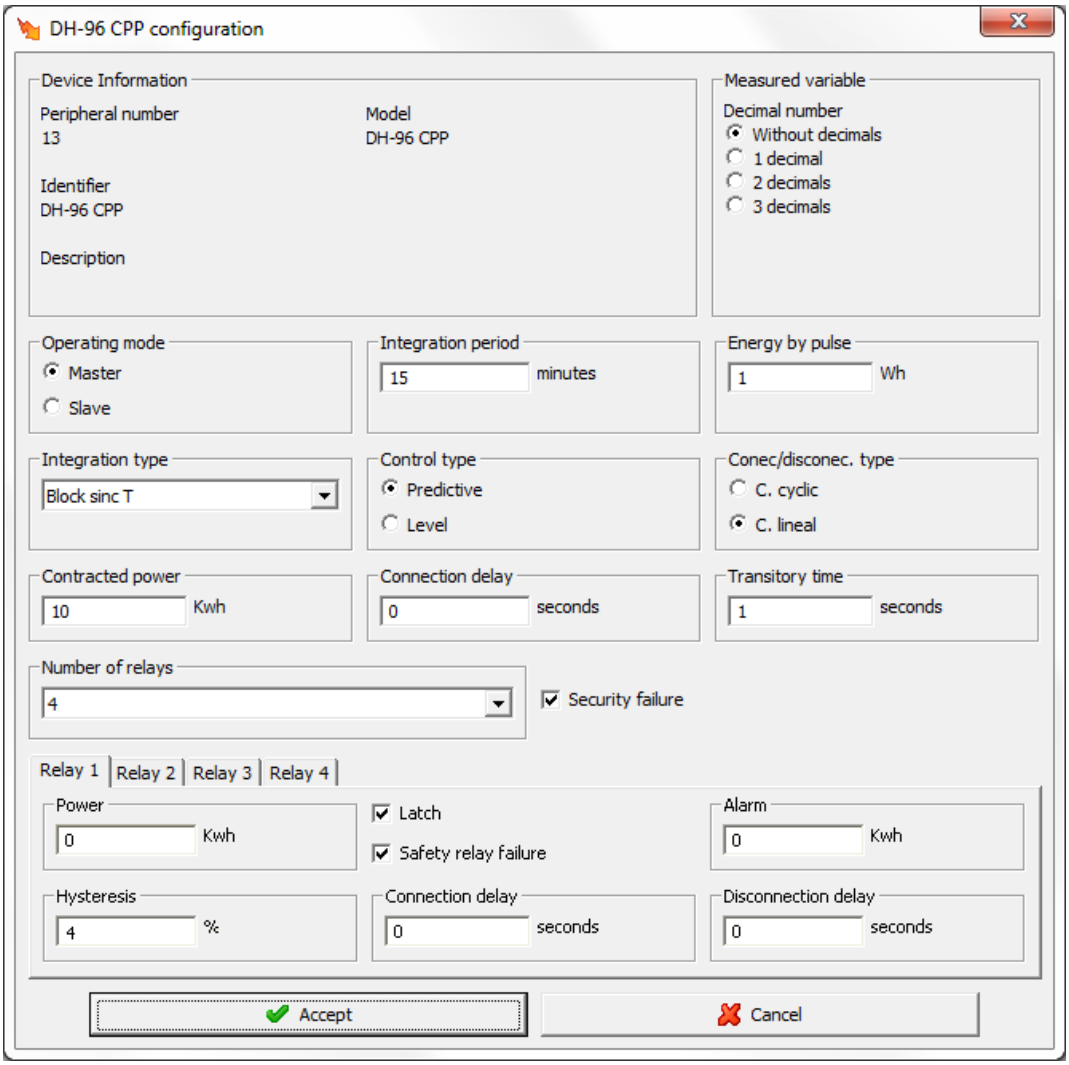


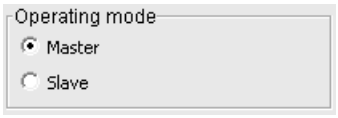
Only for DH-96 CPM equipment. The number of decimal places used displaying the voltage on the equipment can be configured. This parameter will be used solely as information on your computer, and at no time will it be sent or read by the equipment.



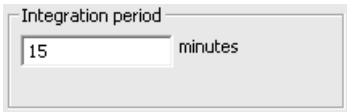
Only for DH-96 CPM equipment. The number of decimal places used displaying the current in the equipment can be configured. This parameter will be used solely as information on your computer, and at no time will it be sent or read by the equipment.

For DH-96 CPP devices the parameters screen changes substantially:

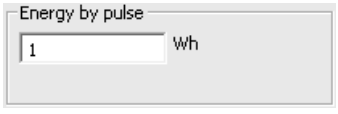




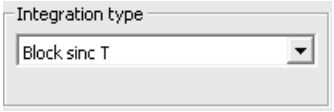
The operating mode of the DH-96 is selected, in Master mode the device controls the relays, in Slave mode control is done via modbus.



The integration period in minutes is entered (from 1 to 60). In thermal integration mode, the desired response time will be 90% of the final value.



The energy value relating to each KYZ pulse received by the equipment is entered.



The equipment integration type is selected. The possible values are:

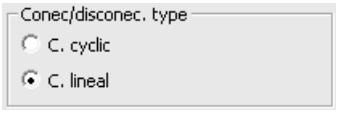
- Block sync P: Synchronized with the company's maximeter, by means of synchronisation pulses that occur at the beginning of each period.

- Block sync T: Synchronized with the company's maximeter, by means of a synchronisation pulse. From this the equipment calculates the beginning and end of each period based on an internal clock. When it receives a new synchronisation pulse it will readjust and again synchronise.

- Rolling: Without synchronisation with the company's maximeter, using a sliding window.

- Thermal: Without synchronisation with the company's maximeter, using a sliding window and simulating the response of the thermal exponential function of the mechanical counters.

Select the operating mode for controlling the relays, two possibilities: predictive control or control by level. This parameter can only be configured when one of the types of integration with synchronisation is selected, the types of integration without synchronisation control will be by level. The control type will depend on the relay configuration.



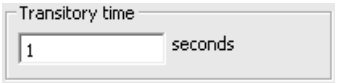
Only in predictive control. The connection/disconnection type is selected. The types are:

- C. cyclic: Cyclic, the relays that have been operating the longest disconnect first.

- C. lineal: Lineal, where connection or disconnection is done by priorities, relay 1 being the first to disconnect.

Only in predictive control. Value of the power contracted for the installation.

Only in predictive control. Minimum waiting time before reconnecting a relay.



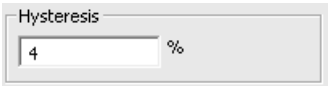
Only in predictive control. Time to adapt the controller response time to the characteristics of the installation.

The number of relays to be used in the installation is selected.

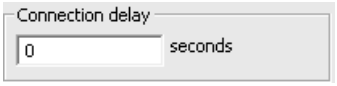
Only in predictive control. It will only be possible to choose between the two status modes of the contract.

Only in predictive control. Value of the power contracted for each of the relays.

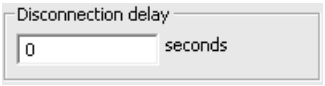
Only in control by level. Value of the demand at which the alarm is triggered.



Only in control by level. The desired difference between the connection and disconnection point of the relay is entered in %. The value must be between 4 and 50 %.

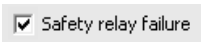


Only in control by level. Time elapsed from end of alarm situation until relay is connected.



Only in control by level. Time elapsed from when the alarm value is exceeded until the relay is disconnected.

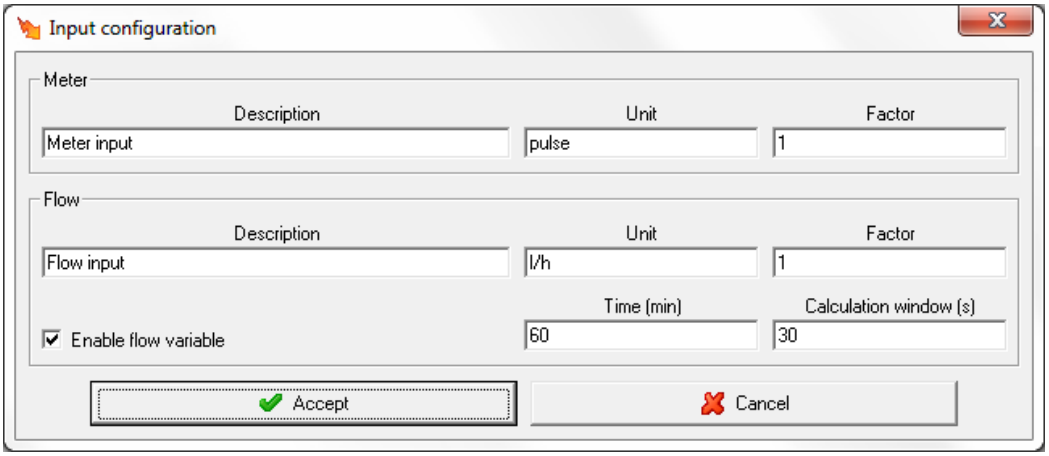
Only in control by level. Specifies whether or not the alarm will remain locked after it has been triggered, even though the condition that caused it disappears.



Only in control by level. It will only be possible to choose between the two status modes of the contract for each of the relays.

1.39.1.2 Inputs

Only for DH-96 CT devices.



This screen lets the flow and counter variable that can be used on the DH-96 CT equipment be configured.

- **Counter Variable**
  - **Description:** Alphanumeric type data which allows a brief description of the input for better identification.
  - **Unit:** Alphanumeric type data which enables a brief description of the input units to be entered.
  - **Factor:** Multiplier factor to be applied to the value read from the device.

- **Flow variable: T**he input will be treated as a flow counter. The value of this variable is calculated from the counter variable value read from the device.

    - **Enable flow variable:** Using this option it is possible to enable or disable use of the device input software as if it were a flow counter. If this is disabled it will not be displayed, nor will it be possible to use this variable on the software.

    - **Description:** Alphanumeric type data which allows a brief description of the input for better identification.

    - **Unit:** Alphanumeric type data which permits a brief description of the units to be entered.

    - **Factor:** multiplier to be applied to the value read from the device.

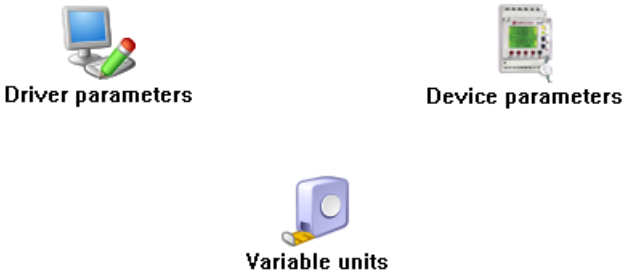
    - **Time:** Parameter to calculate the flow value.

    - **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device counter.

1.40.- EDMk

1.40.1 Driver options

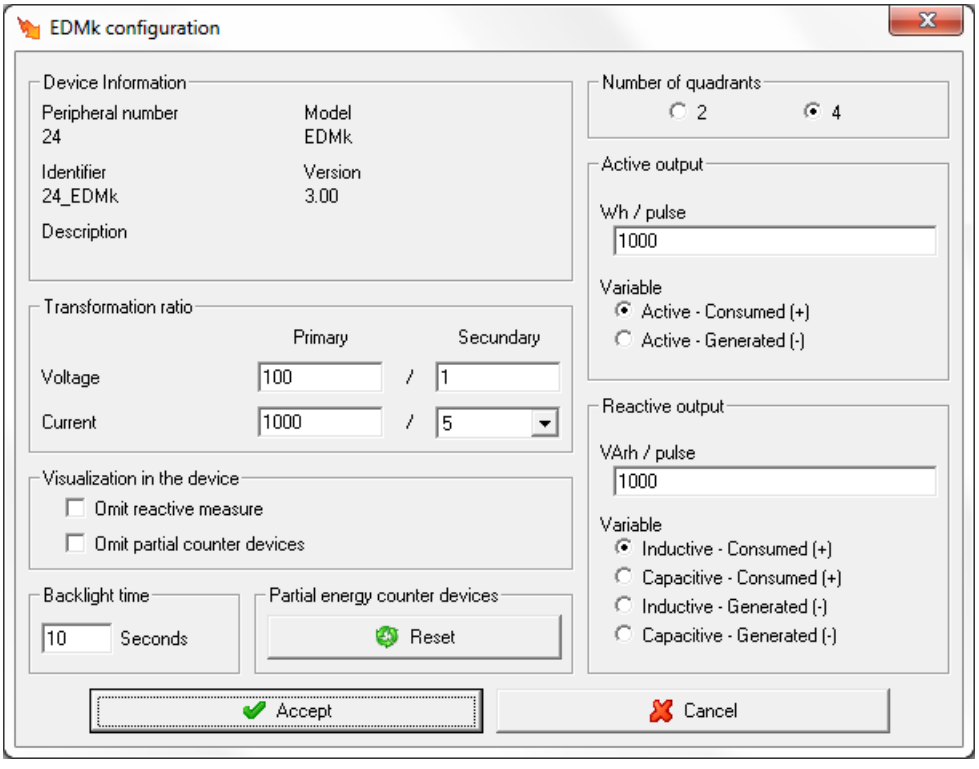
Options menu:

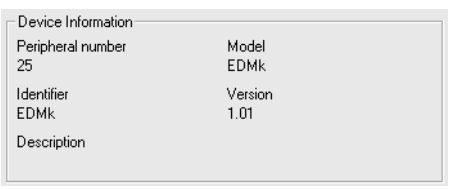


The *'Variable units'* option is detailed in section 1.1.2 Variable Units.

1.40.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "*Accept*" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.





Shows general information.

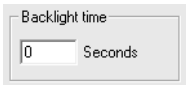
Configuration of the transformation ratio of the device.

- **Voltage transformation ratio:** Primary and secondary voltage programming. The product between the primary value and the primary current must be the same as or less than 20.000.000. The primary value must be between 1 and 999.999 V while the secondary can be between 1 and 999 V.

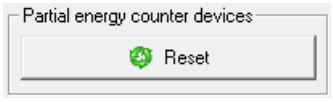
- **Current transformation ratio:** This is the primary and secondary current value the device has. The primary can value between 1 and 9999 A and the secondary between 1 or 5 A.

Device screen display

- **Omit reactive measurement:** The reactive measurements are not shown on the device screen, although they will continue to be displayed on the software display screens.
- **Omit partial counters:** Partial counter measurements are not shown on the screen of the device nor on the display screens of the software.

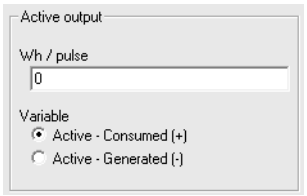


Configuration of the "*backlight*" disconnection. The value should oscillate between 0 and 10 seconds.

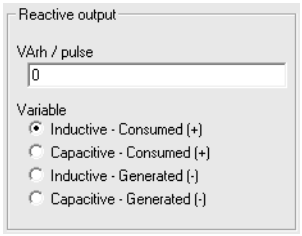


On clicking the button all the partial counters of the device will be started.

Configuration of the number of quadrants. With only 2 quadrants the consumed energy counters will be taken into consideration and with 4 the consumed and generated energy counters.



Configuration of the output relay of the active energy. The number of Wh equivalent to an output impulse and the variable that will be measured to give this pulse. If the pulse value is 0, the output will be treated like a standard digital output, enabling it value to be forced from 0 to 1.



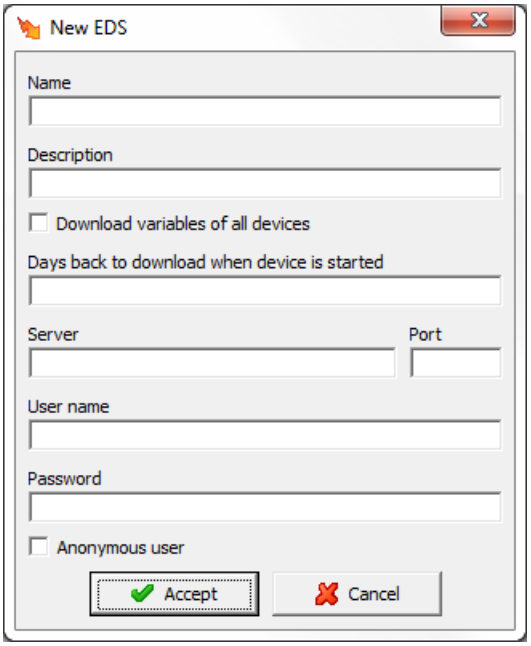
Configuration of the output relay of the active energy. The number of VArh equivalent to an output pulse and the variable that will be a measured to give the pulse can be configured. If the pulse value is 0, the output will be treated like a standard digital output enabling it value to be forced from 0 to 1.

1.41.- EDS / EDS-3G

The EDS / EDS-3G driver has a unique feature in that it can access the variables for the equipment that is connected to it, as well as its own variables for flow, meters, and digital inputs and outputs.

1.41.1 Configuration of EDS device

Use the devices menu to add a new EDS as a first level device.



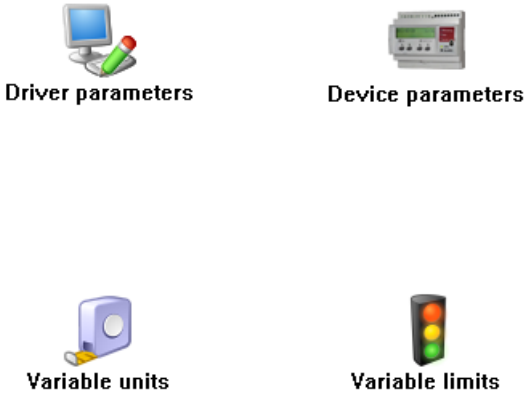
As shown in the previous dialogue box, the address and port of the EDS equipment to which we want to connect must be indicated, and also the user and password if authentication is enabled.

The 'Download variables of all devices' option may be chosen, in which case all machines and variables accessible in the remote EDS will automatically be downloaded. If this option is not set, each variable must be added manually.

The 'Download dates previous to the current date when the device is started' option will show the number of days before the current date for which the files will be downloaded since the communications are established with the unit for the first time.

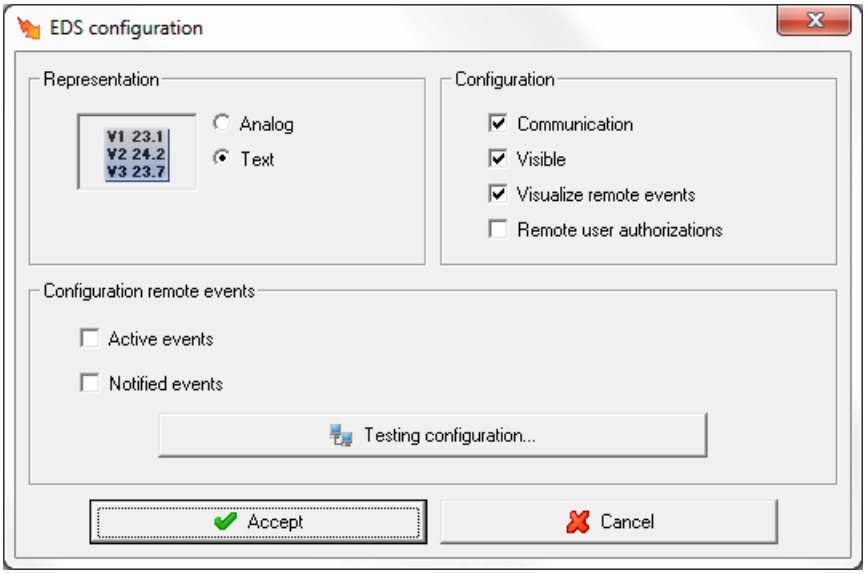
1.41.2 Driver options

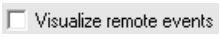
Options menu:



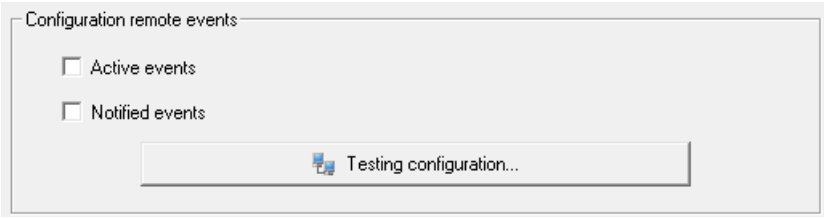
The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.41.2.1 Driver Parameters





Allows the display of remote events in the client to be activated.

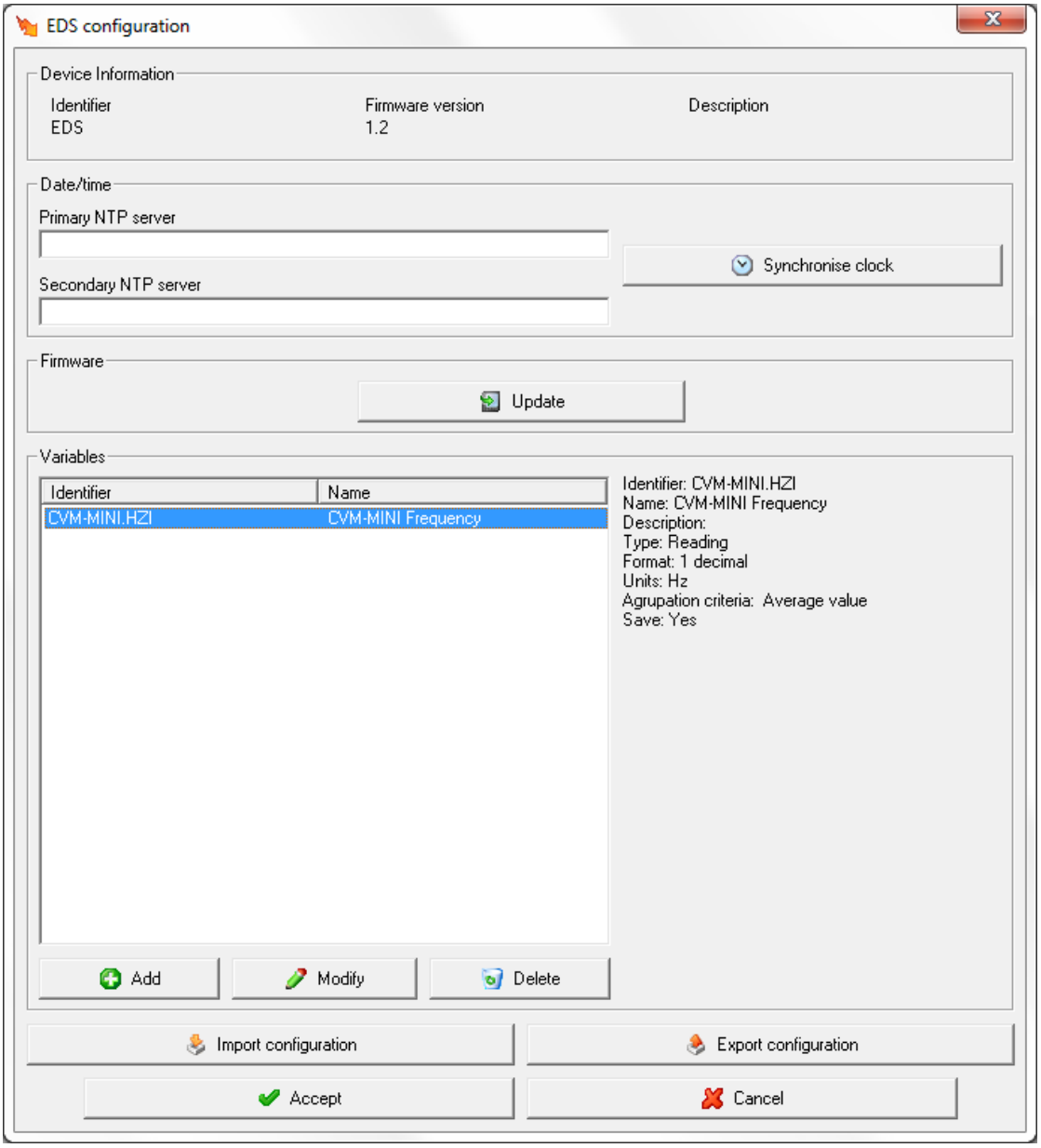


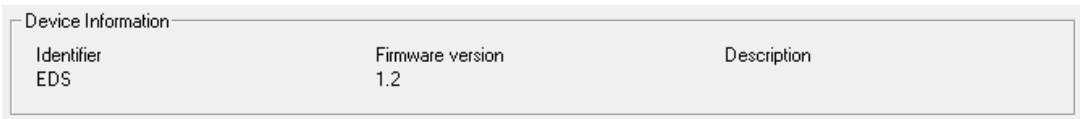
On activating the display of remote events the configuration of remote events will be enabled; here you can activate the types of events you want to receive and you can test communication with the remote equipment. These events can be displayed on the client in the same way as local events.

The remaining screen parameters are detailed in section 1.1.1 Driver parameters.

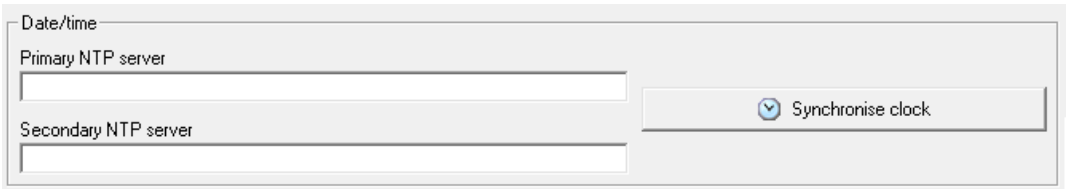
1.41.2.2 Device parameters

This screen is used to configure the variables that must be requested from the EDS relating to the machines connected to it. In this case variable 'Frequency' of device 'CVM-MINI has been selected.



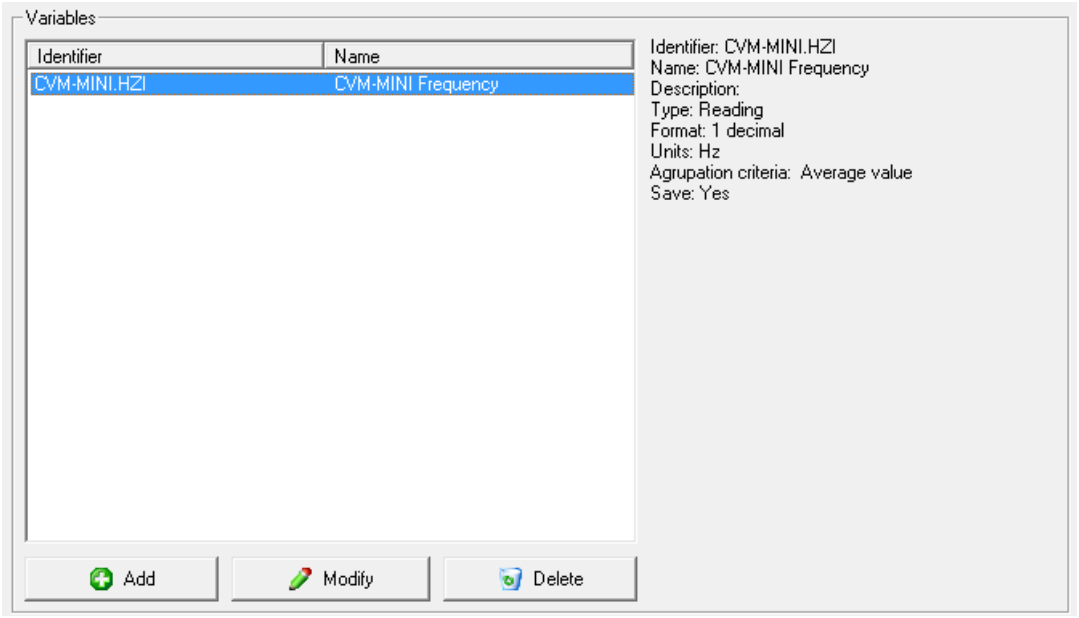


General information on the EDS device.



Possibility of sending the time and date from the PC to the EDS device or configure an NTP server so that the device itself sets its time through the server.

The unit's firmware can be manually updated by selecting the file with the '*upgrade*' extension.



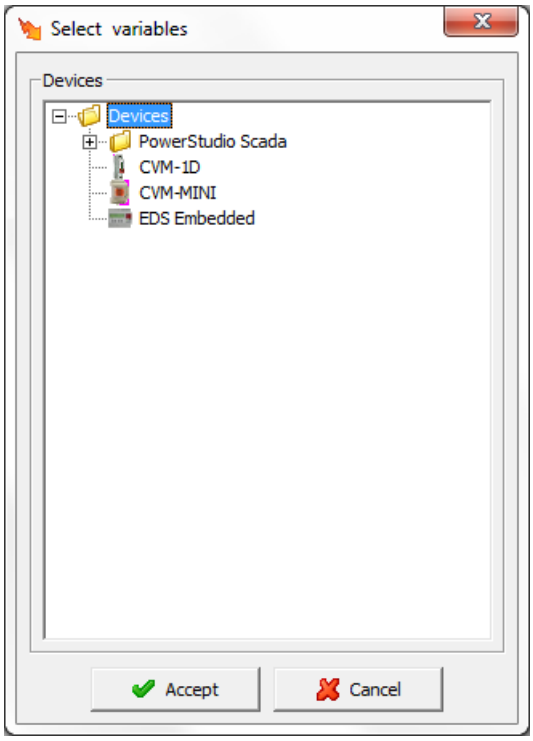
Configuration of the variables added to the EDS device.

Allows a variable configuration that was previously saved to disk to be loaded. This option is useful when the same variables have to be configured on several EDS devices.

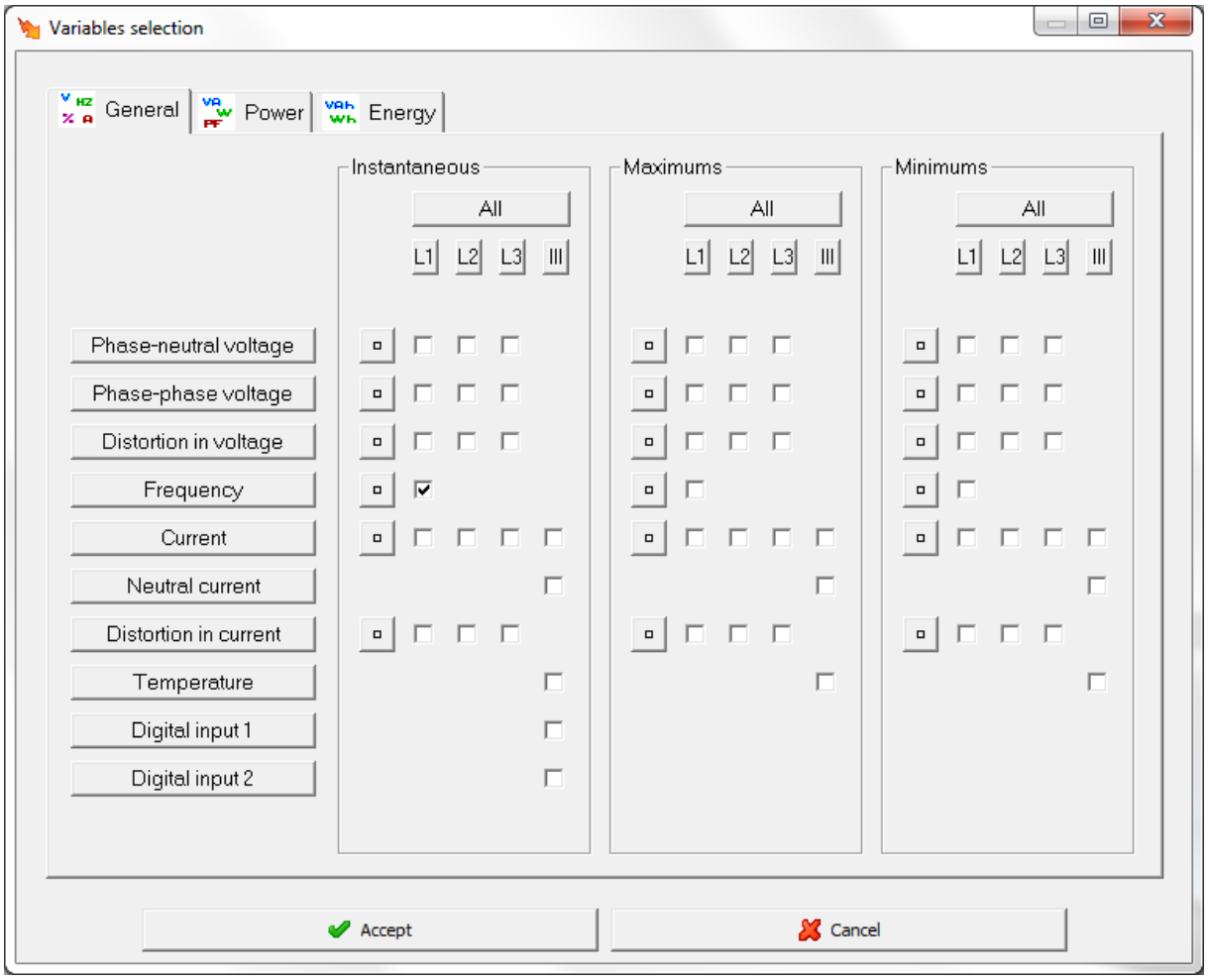
Allows the variable configuration to be saved to disk, so that it can subsequently be loaded on another EPS device.

1.41.2.2.1 Variables

When the 'Add' button is pressed a selection tree for the EDS devices will appear. When a device is selected, its variables selection screen will appear, and the desired variables may be added.



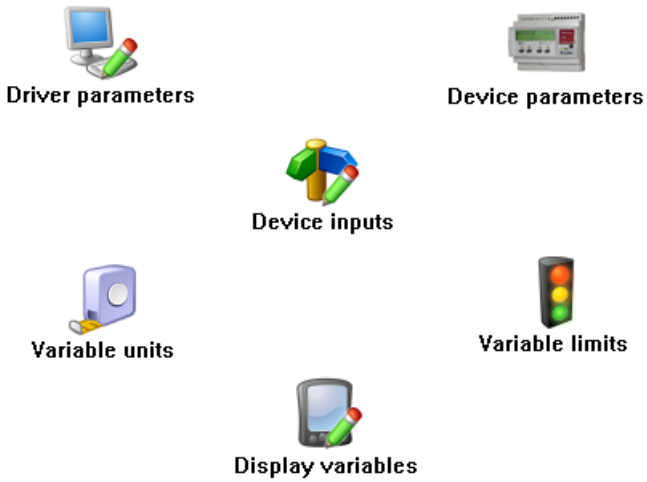
As an example of the variable selection screen we have that of a 'CVM-MINI' where we can see that the instantaneous 'Frequency' variable has been selected.



1.42.- EDS EMBEDDED / EDS-3G EMBEDDED[7]

1.42.1 Driver options

Options menu:

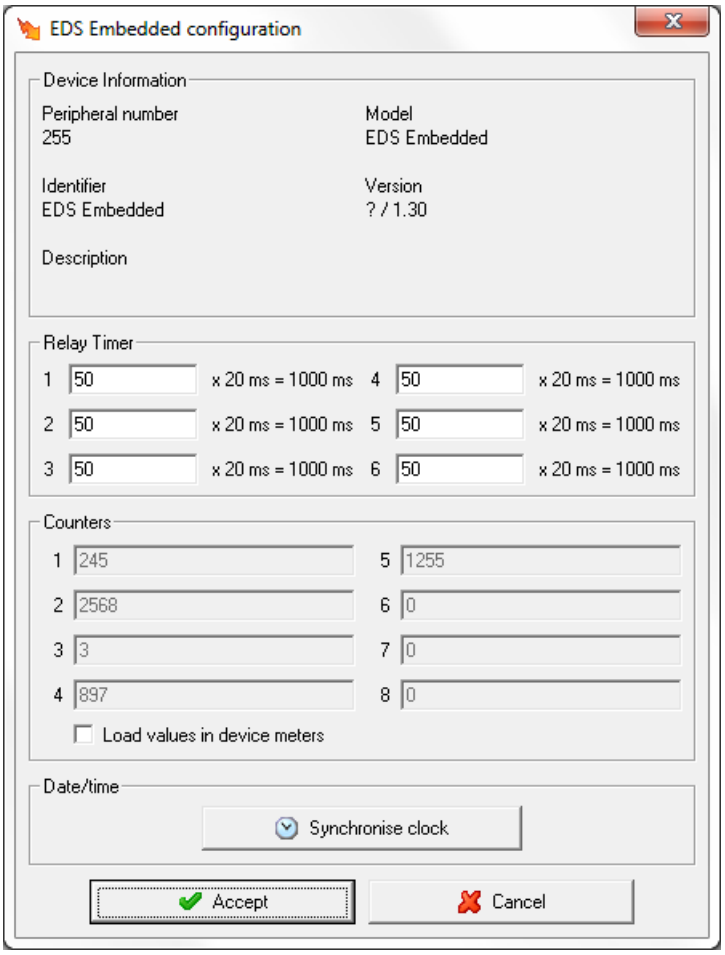


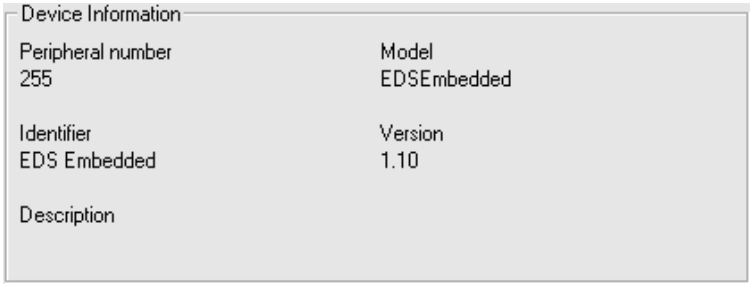
The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

1.42.1.1 Device parameters

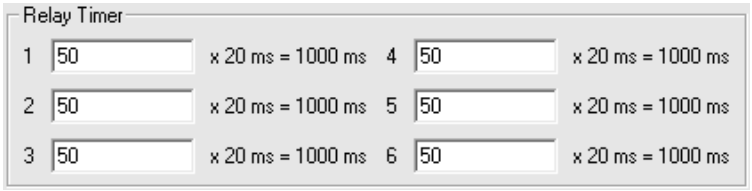
This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "*Accept*" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

[7] Sólo en aplicación diseñadas para funcionar dentro del EDS.

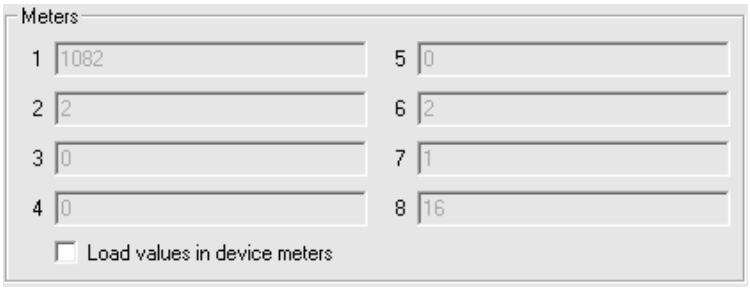




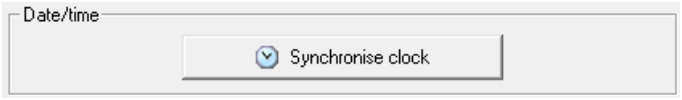
General information on the EDS Embedded device.



Allows you to configure each relay timer in ms.

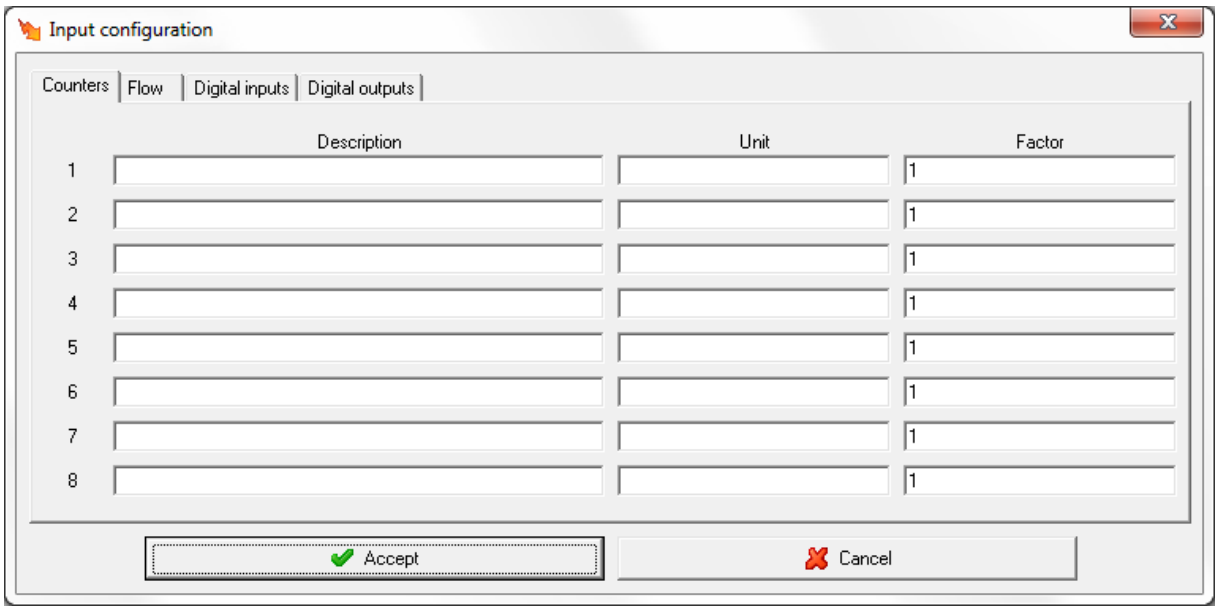


It is possible to load a value into the device's meters.



Allows you to send the PC date and time to the EDS Embedded device.

1.42.1.2 Device inputs



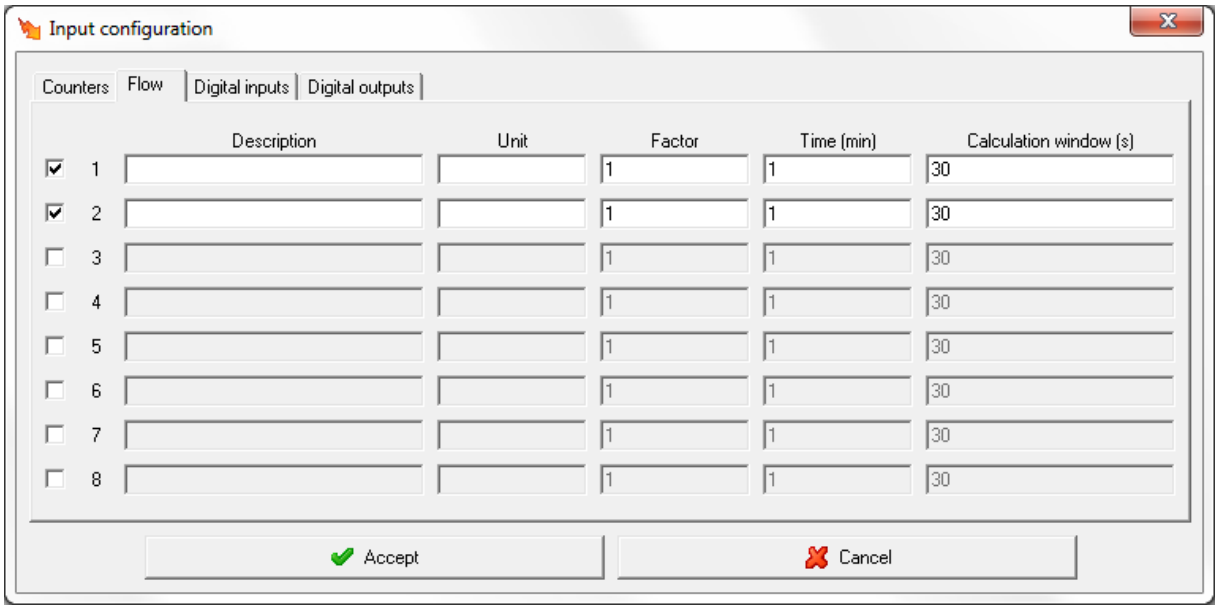
Use

to switch between the flow, digital inputs and outputs configurations of the meters. The previous image shows the configuration of the meters.

it is possible to configure the following information for each of the eight meters:

- **Description:** Alphanumeric type data to identity the meter on the device display.
- **Unit:** Alphanumeric type datum to identify the meter units.
- **Factor:** Multiplier value which can be read on the meter.

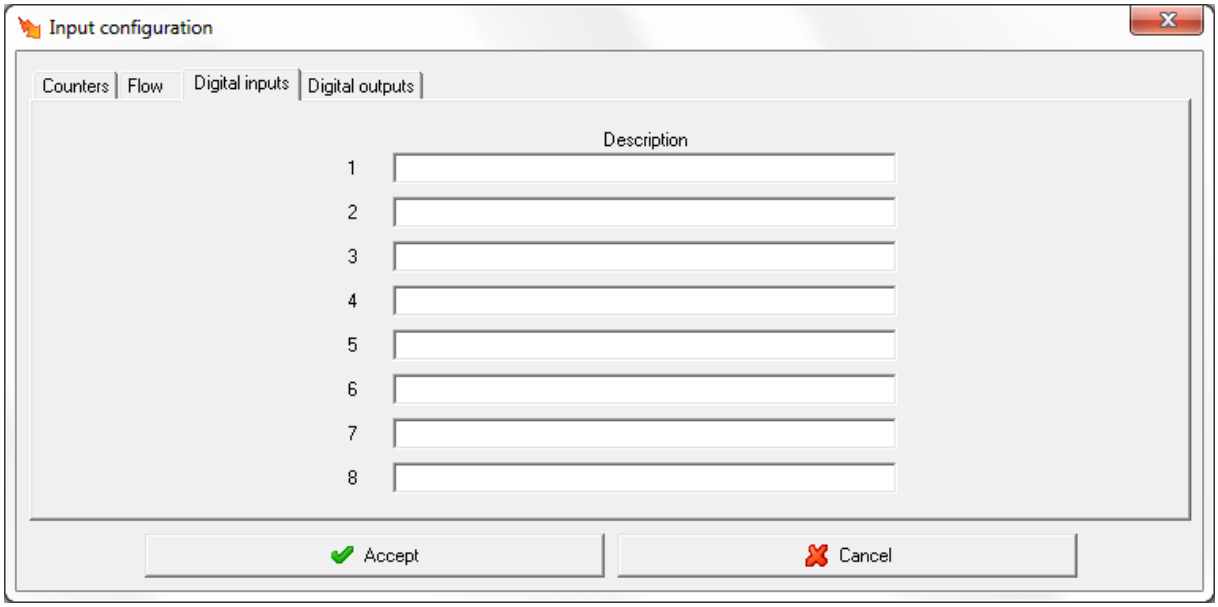
The configuration of the flows will look as follows:



Checking the selector ☑ will activate the flow variable. Remember if the selector is not checked it will not be possible to view the flow value of the related EDS Embedded input.

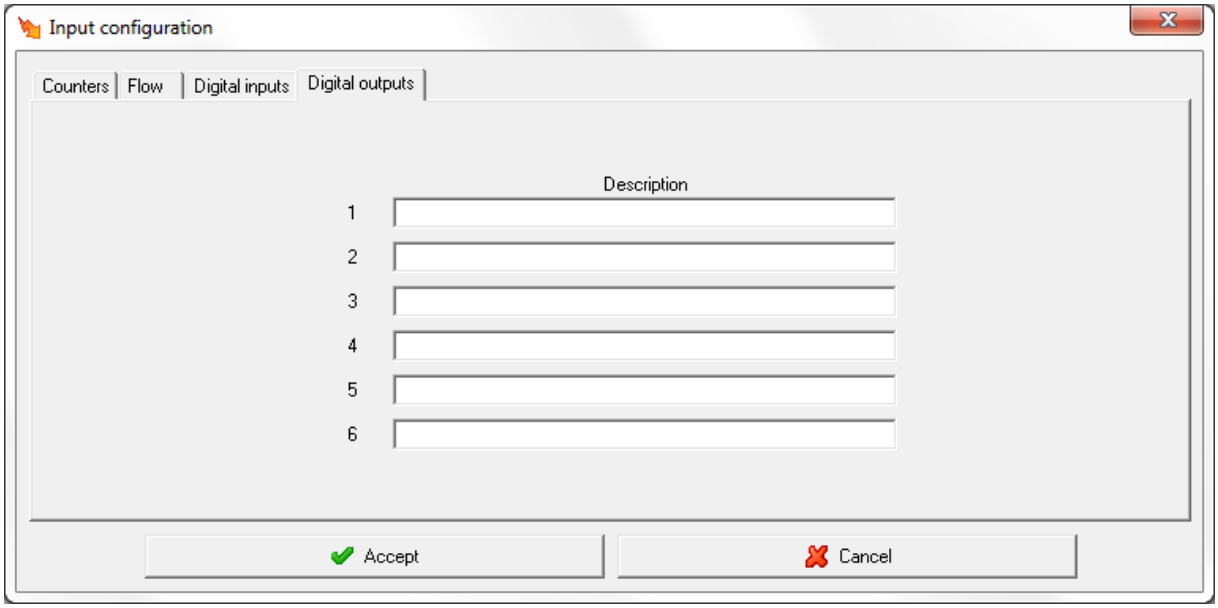
- **Description:** Alphanumeric type data which permits a brief description of the flow to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the flow is shown to be entered.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device meter.

The configuration of the digital inputs is as follows:



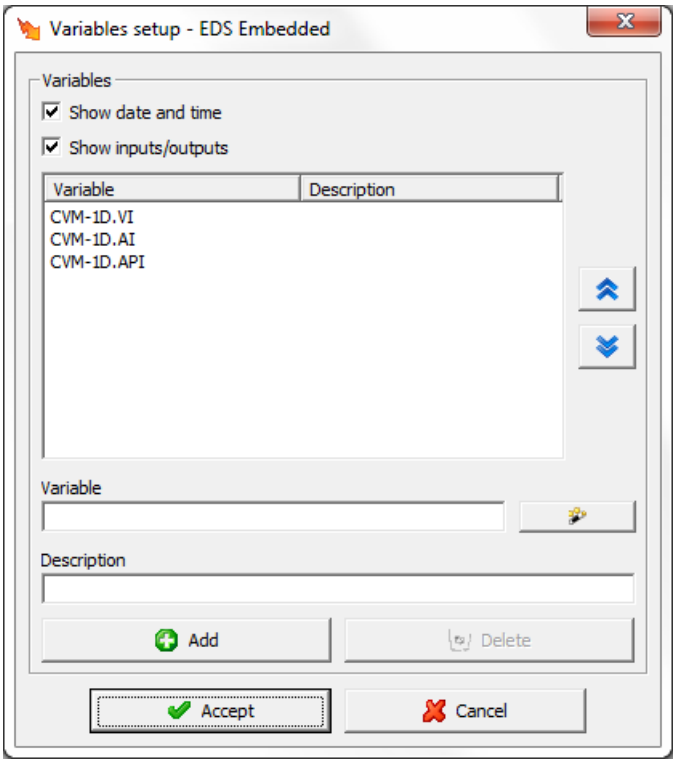
- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

Finally, the configuration of the digital outputs is as follows:



- **Description:** Alphanumeric type data which permits a brief description of the digital output to be entered for better identification.

1.42.1.3 Display variables



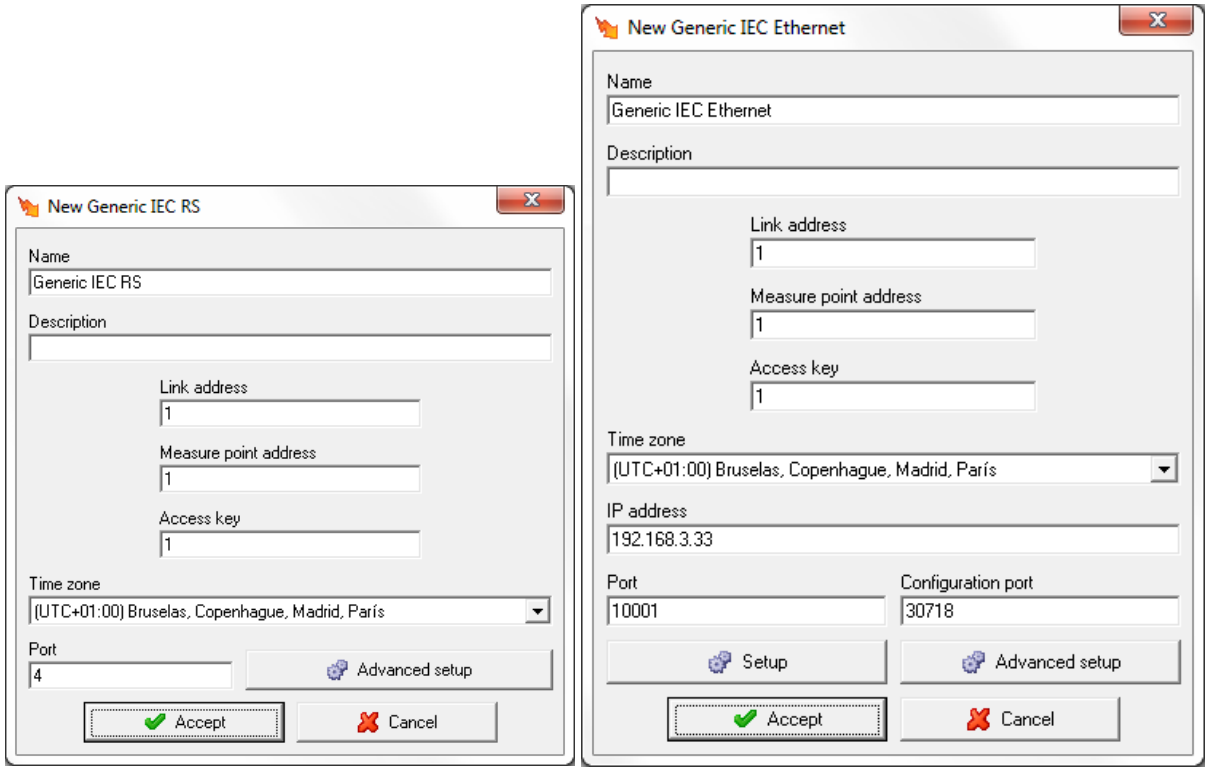
This dialogue box allows you to configure the variables you would like to view on the device's display. You can activate the display of the equipment time and date Show date and time and/or display the input and output variables Show inputs/outputs and/or any other variable accessible from the equipment by typing manually or via the button.

You can attach text to display rather than the variable name. If the description text field is empty, the name of the variable will be displayed.

The order of the variables can be changed so that they are shown in a specific order on the equipment's display using the or buttons.

1.43.- Generic IEC

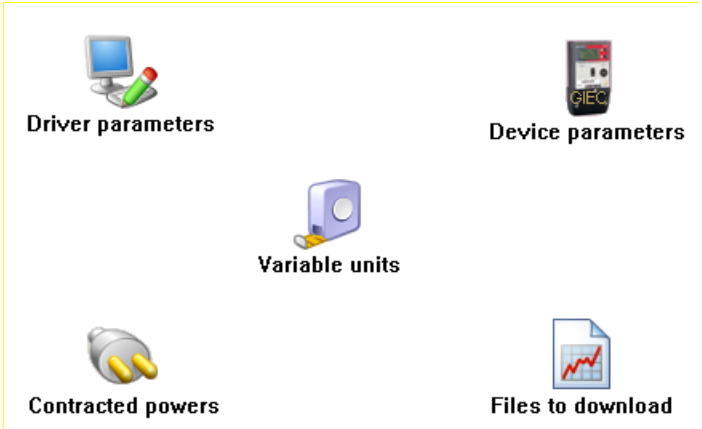
The Generic IEC device allows load curve and bill closure files to be downloaded through the IEC 870-5-102 protocol. The communication, gateway address, measuring point and access key parameters must be configured.



The time zone where the unit is located can be configured on this screen. The time zone of the software will appear by default but this should be modified if a new device is found in a different time zone.

1.43.1 Driver options

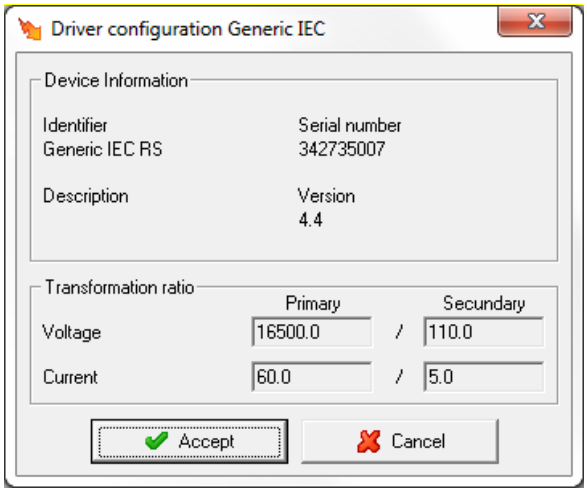
Options menu:

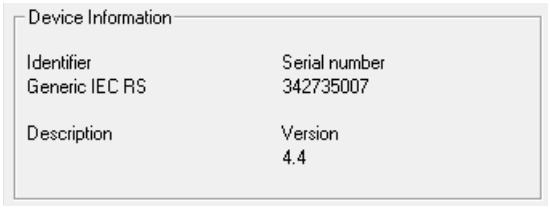


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Unidades de las variables and 1.1.3 Límites de las variables, respectively.

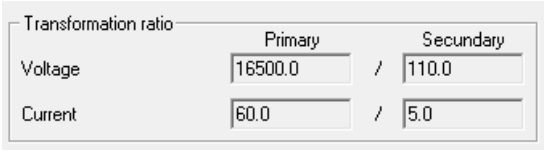
1.43.1.1 Device parameters

This screen will display internal device information and parameters on the screen.





Displays general information.

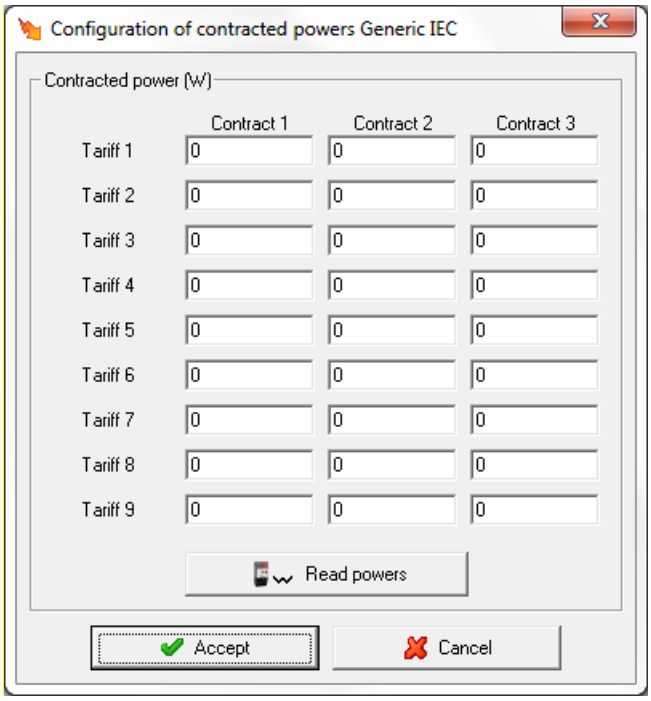


- **Voltage transformation ratio:** Shows the ratio between the primary and secondary voltage programmed in the device.
- **Power transformation ratio:** Shows the primary to secondary current ratio programmed in the device.

1.43.1.2 Contracted power

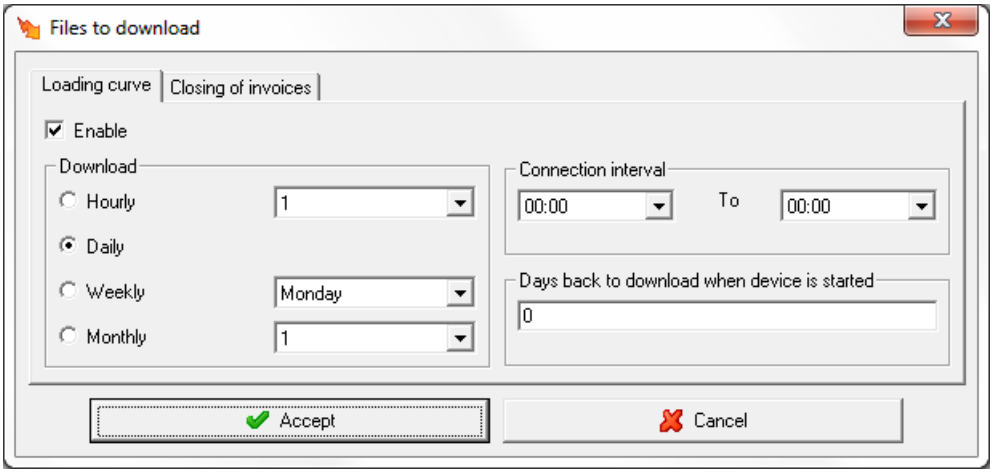
This screen displays the contracted powers. You will always be able to enter the contracted powers manually and read them directly from the unit by pressing the

button.



1.43.2 Files for downloading

The load curve and billing closure file downloads can be configured on this screen.



Select this option Enable to activate the download configuration, depending on the selected parameters.

- **Download**: Selects the download period. It can be Daily, Weekly, Monthly or every x hours selected.
- **Connection interval**: Select the time interval during which the files will be downloaded.
- **Download dates previous to the current date when the device is started**: Shows the number of days before the current date for which the files will be downloaded since the communications are established with the unit for the first time.

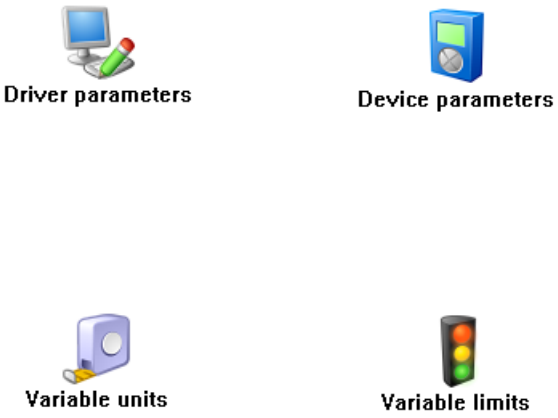
1.44.- Generic Modbus[8]

Due of the variety of devices that communicate with Modbus protocol currently on the market, a generic device to enable quick and easy communication with these devices has been created.

Once the variables to be read have been configured, the device will behave in a manner similar to other devices with which the program communicates.

1.44.1 Driver options

Options menu:

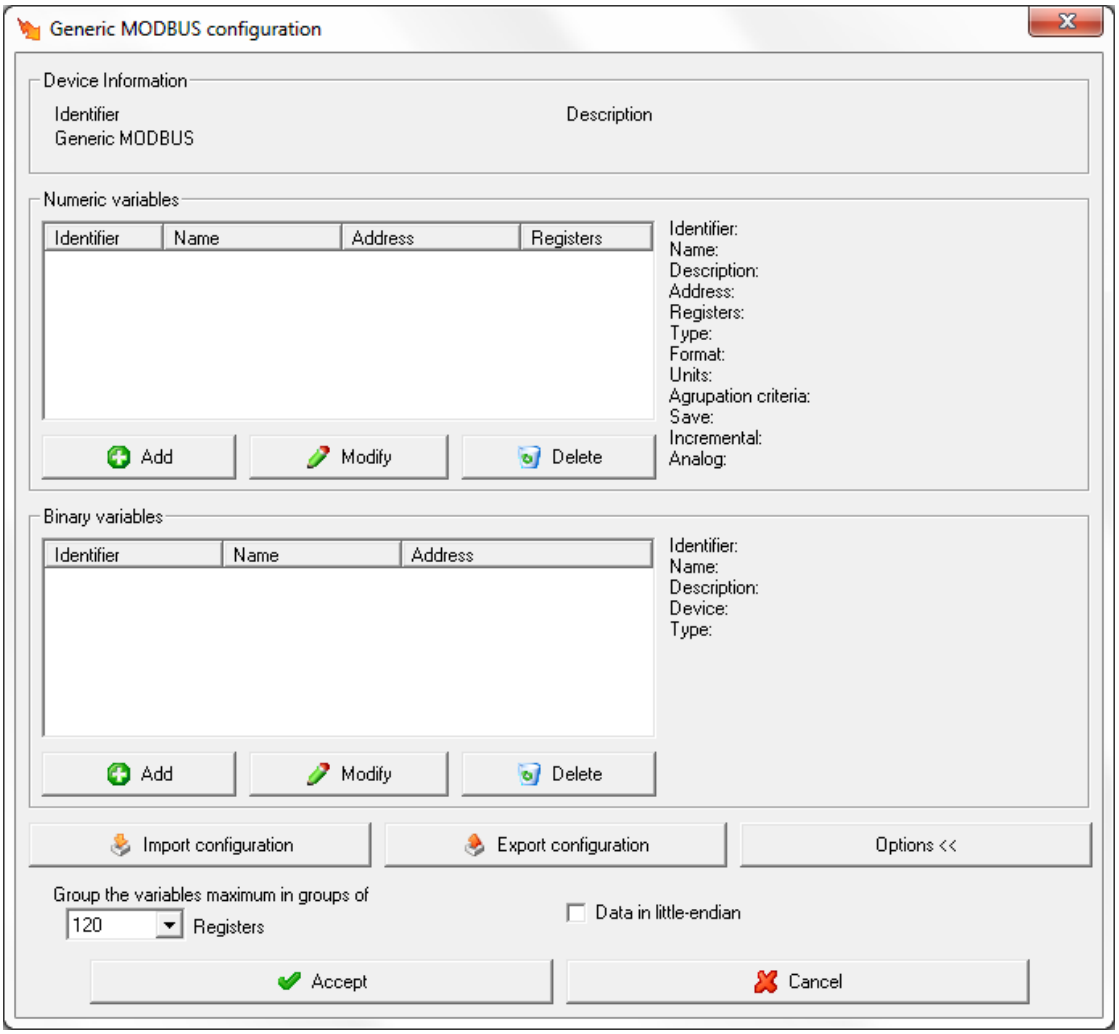


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable Units and 1.1.3 Variable limits, respectively.

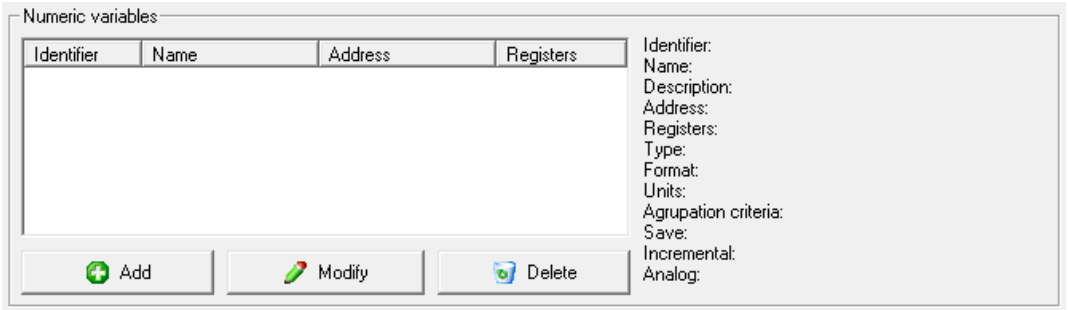
1.44.1.1 Device parameters

This screen is used to configure the variables that should be requested from the device. The variables are in two groups, numeric variables (voltages, currents, counters, etc.) and binary variables (typically digital inputs and outputs).

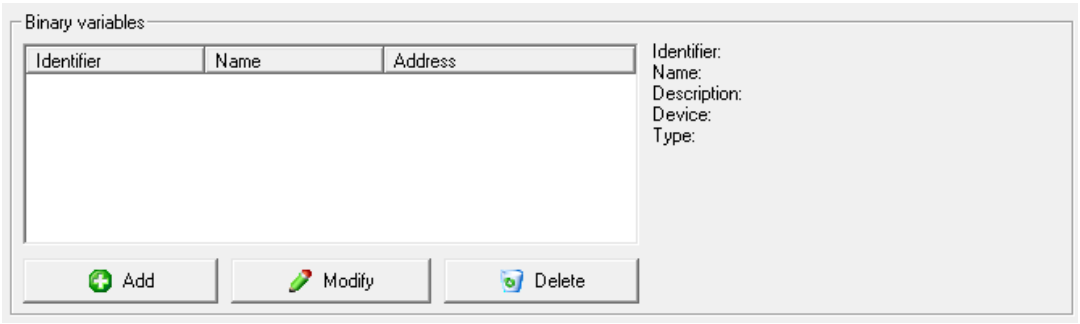
[8] Only in Deluxe version



General device information



Device numerical variables configuration. See 1.44.1.1.1 Numeric variables.

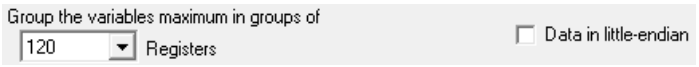


Device binary variables configuration. See 1.44.1.1.2 Digital variables.

Allows the configuration of numeric and binary variables of a file previously saved on the disk to be loaded. This option is useful when the same variables have to be configured on several devices

Allows the configuration of numerical and binary variables to be saved on a disk and then loaded onto another Generic Modbus TCP device.

Allows advanced configuration options on the device to be displayed or hidden.

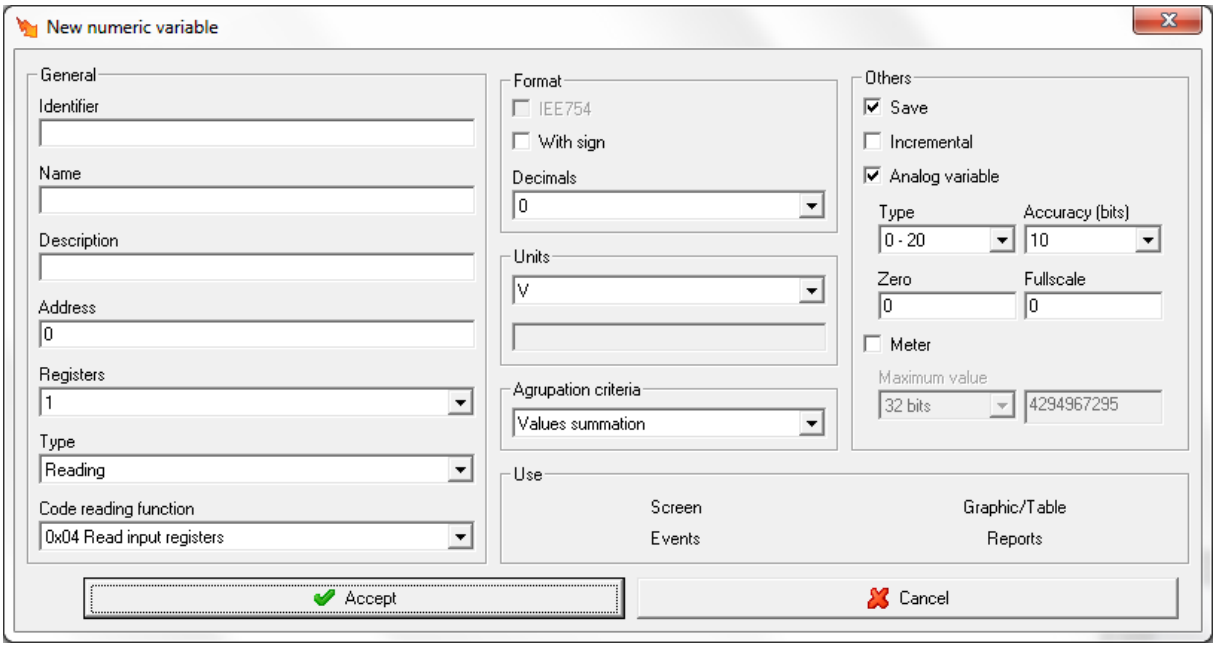


- **Brings together variables in groups:** These parameters permit the maximum size of the frames to be configured in communications for those devices which do not permit communication with frames of a maximum size greater than that of the Standard modbus. To carry out the minimum number of possible requests and thus penalize the communication as little as possible, the program will try to arrange the configured variables into groups of variables. This parameter can indicate the maximum grouping permitted

- **Data in little-endian:** By default the data sent by devices is considered to come in big-endian. If the device returns it in little-endian this option should be enabled.

1.44.1.1.1 Numeric variables

Click the “Add" or “Modify” button and the dialogue will appear to configure the numeric variable.



Where

- **Identifier:** Allows each of the numeric variables to be used in expressions and conditions, to be identified, see 'Editor Manual'.
- **Name:** Name of the numeric variable used to identify it better.
- **Description:** Short description of the variable.
- **Address:** Modbus map address of the device where the variable can be found.
- **Records:** Number of registers which occupy the variable on the Modbus map.
- **Type:** Selects the type of variable; i.e., read, write or both. If the variable is write or read/write the value can be forced on the device.
- **Read function code**: Selects the read function. You can select the 0x03 or 0x04 function.
- **Format:** Indicates the format in which the device returns the variable value. The value can be expressed in the IEE754 format, with a symbol, and the number of decimal points may be indicated.
- **Units:** Units in which the value is expressed. You can select one of the predefined units or define a new user unit.
- **Grouping criteria:** Enables the grouping criteria of the values of the variable to be selected in graphs, tables, or reports, and the value to be saved in the values register. For example, if in the period between saving information we have 3 values (10, 12 and 7) these will be saved in the log.
    - Maximum value. The maximum value of the 3 (12) will be saved
    - Minimum value: The minimum value of the 3 (7) will be saved.
    - Average value: The average value of the 3((10 + 12 + 7) / 3 = 9.66) will be saved.
    - Last value: The last value will be saved (7).
    - Sum of the values: The sum of 3 values (10 + 12 +7 = 29).

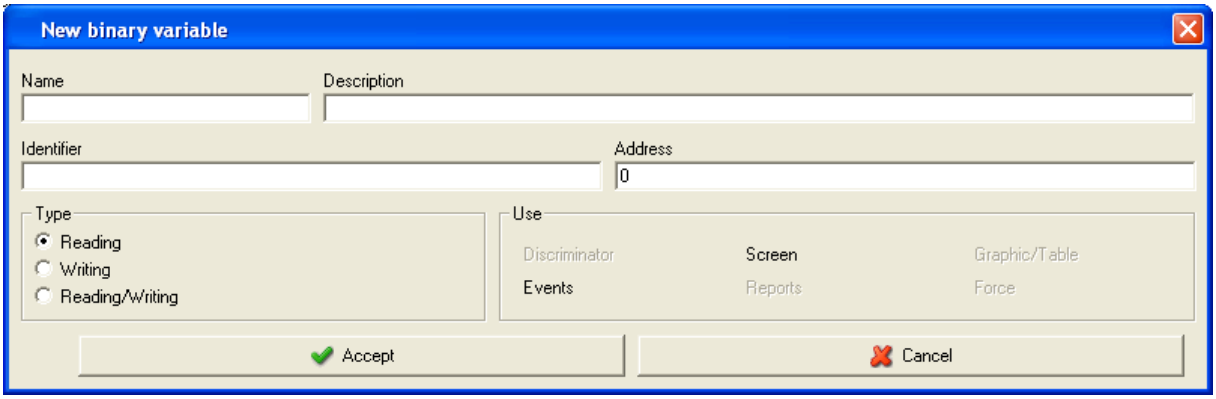
In the case of clusters of values in graphs, tables and reports, the same criteria will be followed, except when it is the summation of values where the sum of 3 values is shown (10 + 12 + 7 = 29).

- **Others:** Different parameters to configure in the variable.
    - **Save:** Indicates if the device value read should be saved on the value log or not.
    - **Incremental:** Indicates whether the value of the variable displayed is incremental. Typical energy variable option to see increments.
    - **Analogue variable:** Indicates whether the variable to be read is of the analogue type.
    - **Type:** Type of output, allows between 0-20 mA, 4-20 mA or 0 -? V, depending on the device.
    - **Accuracy:** Number of bits in the sample.
    - **Zero:** Value of the parameter to which the zero of the scale is assigned.
    - **Fullscale:** Value of the parameter to which the maximum value of the scale is assigned.
    - **Meter**: Indicates whether the variable is of the meter type or not.
    - **Maximum value**: Maximum meter variable value. You can select 32 bits, 16 bits, 8 bits or a custom value.
- **Use:** Shows where the variable may be used in the rest of the program.

For more information on the digital map of numeric variables and its configuration consult the device manual.

1.44.1.1.2 Digital variables

Push the “Add" or “Modify” button and the dialogue will appear to configure the binary variable.



Where

- **Name:** Name of the numeric variable used to identify it better.
- **Description:** Short description of the variable.

- **Read function code**: Selects the read function. You can select the 0x01 or 0x02 function.
- **Identifier:** Allows each of the binary variables, which are to be used in expressions and conditions, to be identified, see 'Editor Manual'.
- **Address:** Modbus map address of the device where the variable can be found.
- **Type:** Selects the type of variable; i.e., read, write or both. If the variable is write or read/write the value can be forced on the device.
- **Use:** Shows where the variable may be used in the rest of the program.

For more information on the map of binary variables and its configuration consult the device manual.

1.45.- LM-24 M

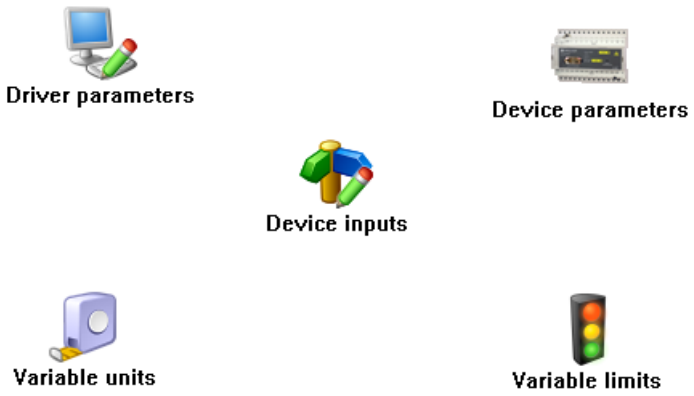
This software only communicates with LM-24 M devices.

1.45.1 Driver options

The options of the LM-24 M can be accessed from:

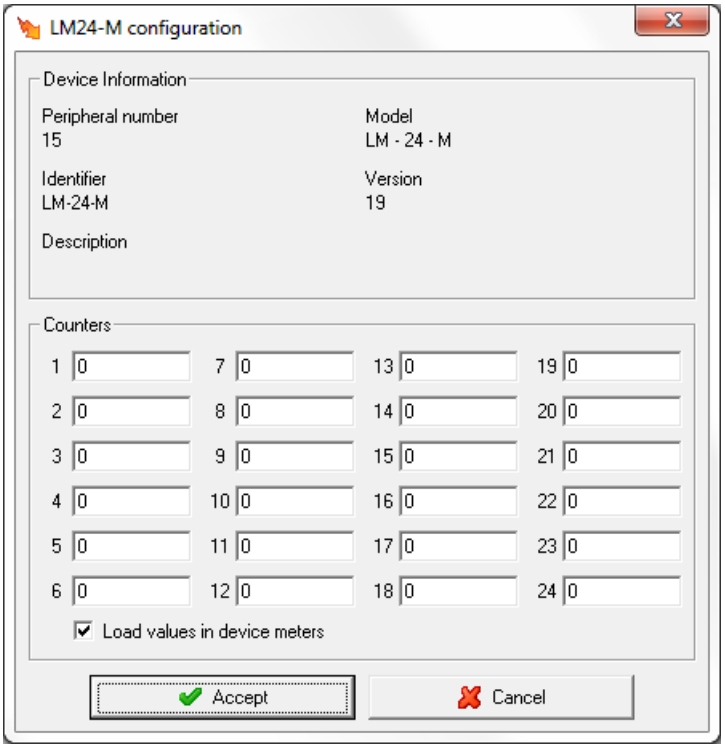
- *View Menu:* Refer to 'Editor manual'.
- *Toolbar*. Refer to 'Editor manual'.

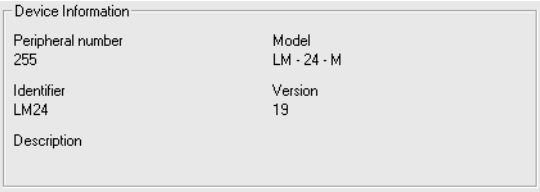
Options menu:



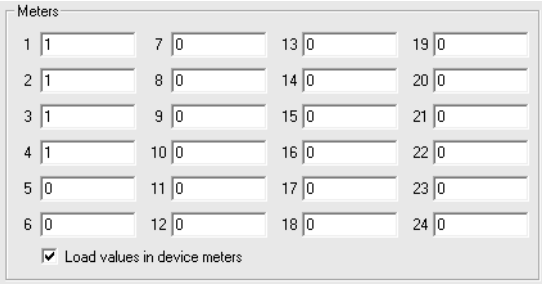
1.45.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.





Shows general information.

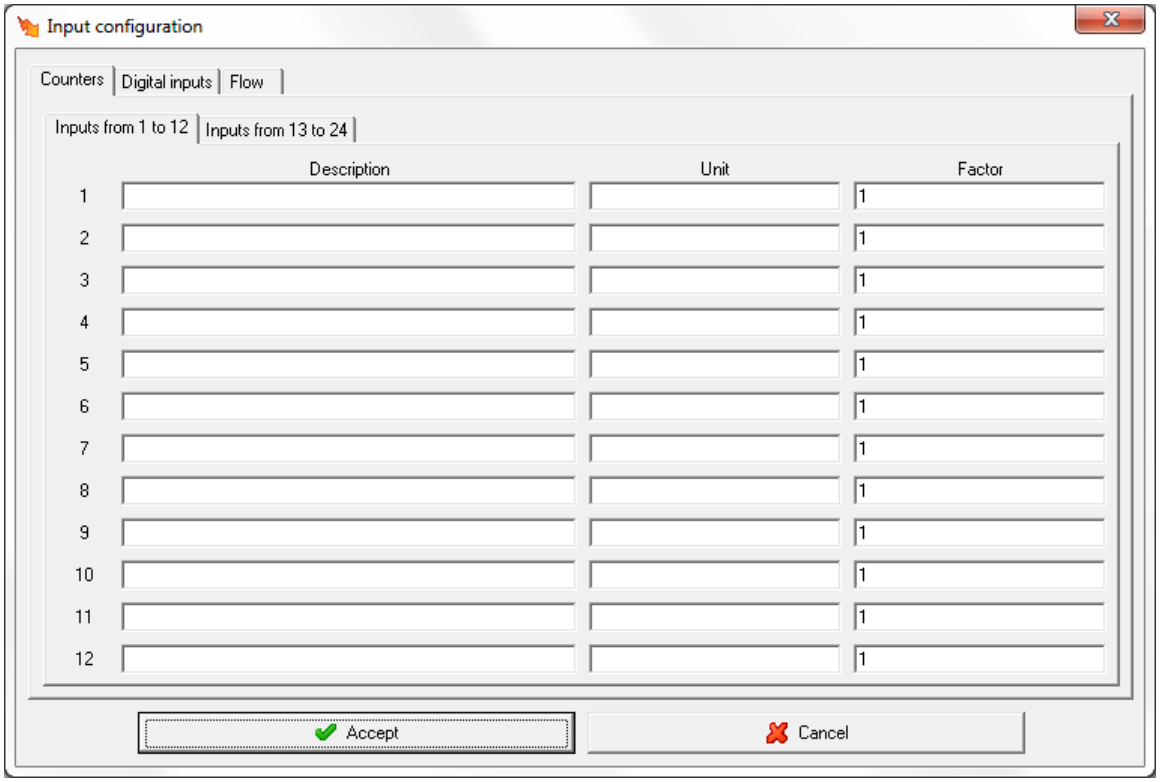


This part of the configuration corresponds to the device counters. ☑ If the selector is checked, on sending the configuration the energy counter will be loaded with the values entered into the corresponding boxes.

1.45.1.2 Device inputs

For each of the inputs of the LM-24 M, three variables will be available, a digital display to show the status of the input (open / closed), a counter variable to show the number of pulses detected at the input, and finally a flow variable calculated by the software as an estimate of the pulse frequency on the input during a space of time.

By means of this dialogue the LM-24 M inputs can be configured.

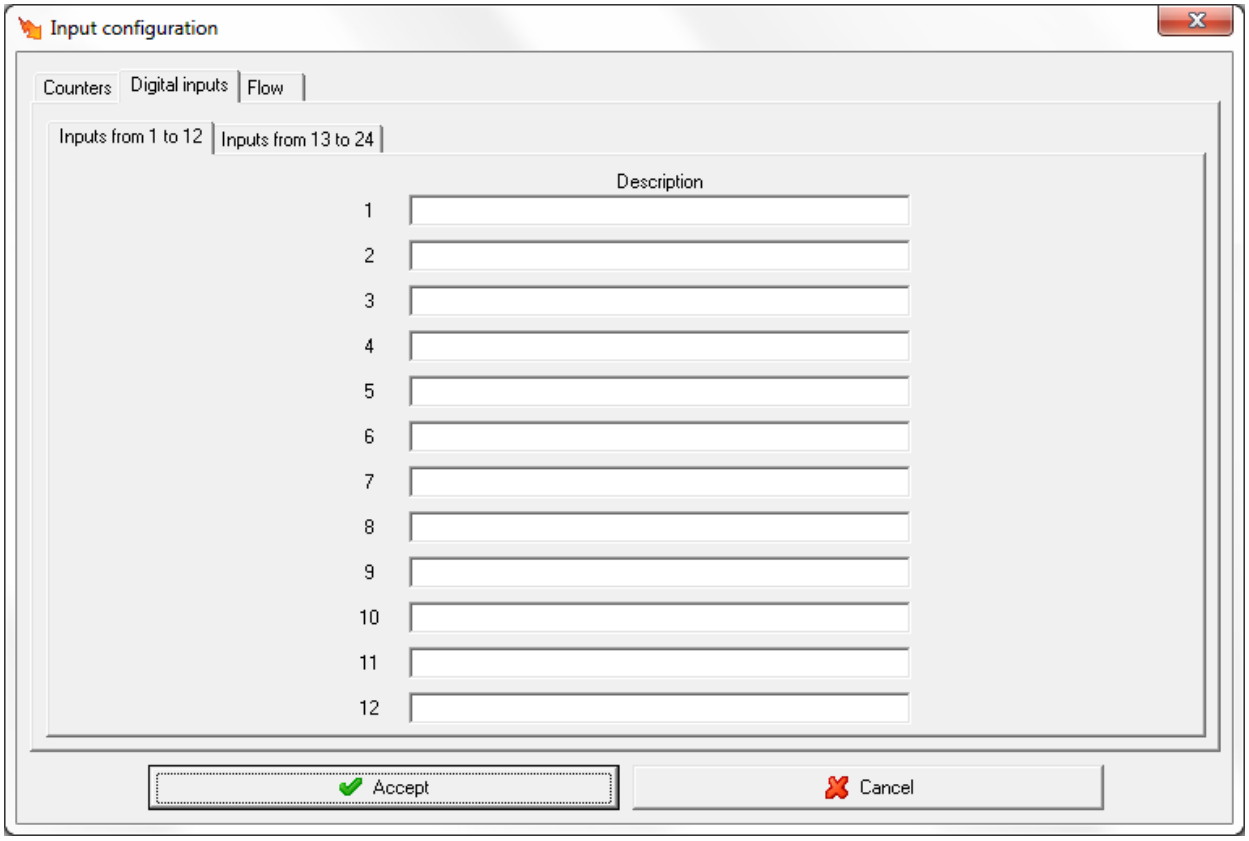


Using the

display configuration of the different types of variables can be configured. The previous image shows the configuration of the counters, where:

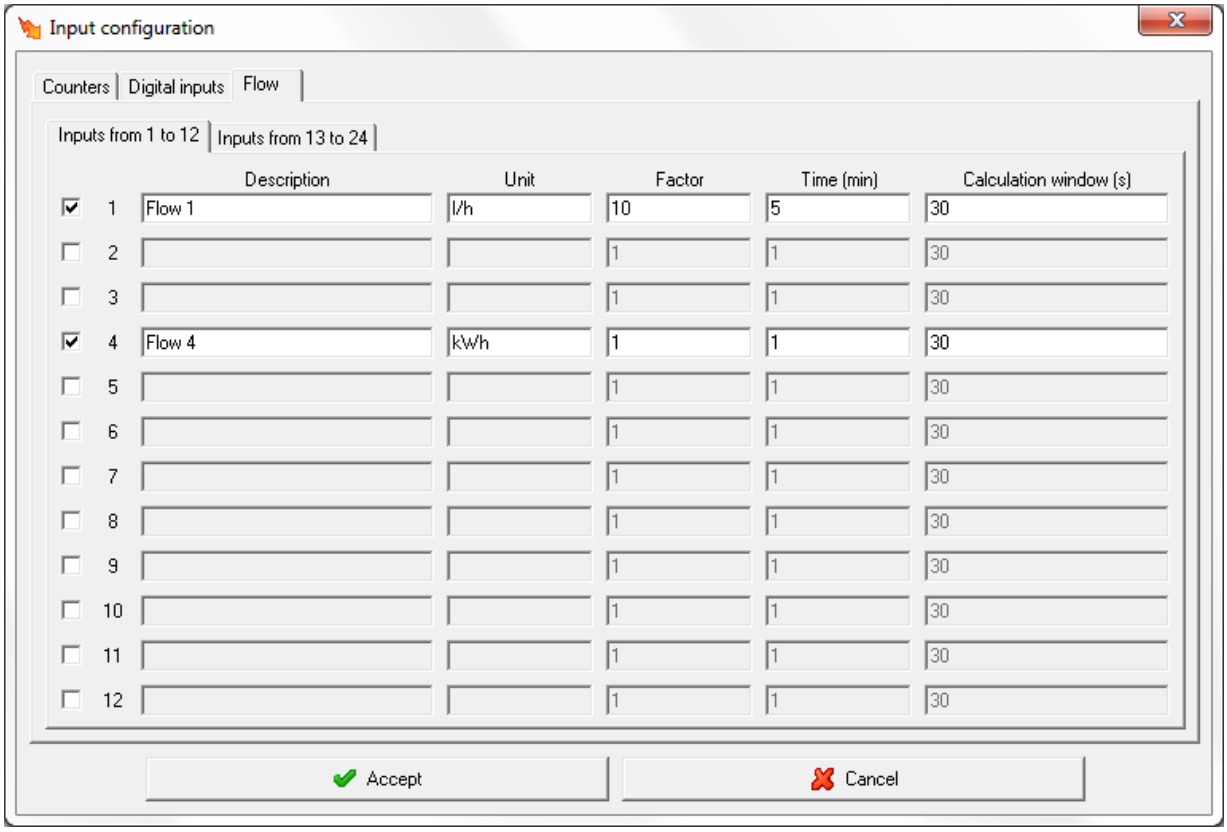
- **Description:** Alphanumeric type which permits a brief description of the counter so it can be identified better.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the counter is displayed to be entered.
- **Factor:** Multiplier value of each input pulse.

For digital inputs:



- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

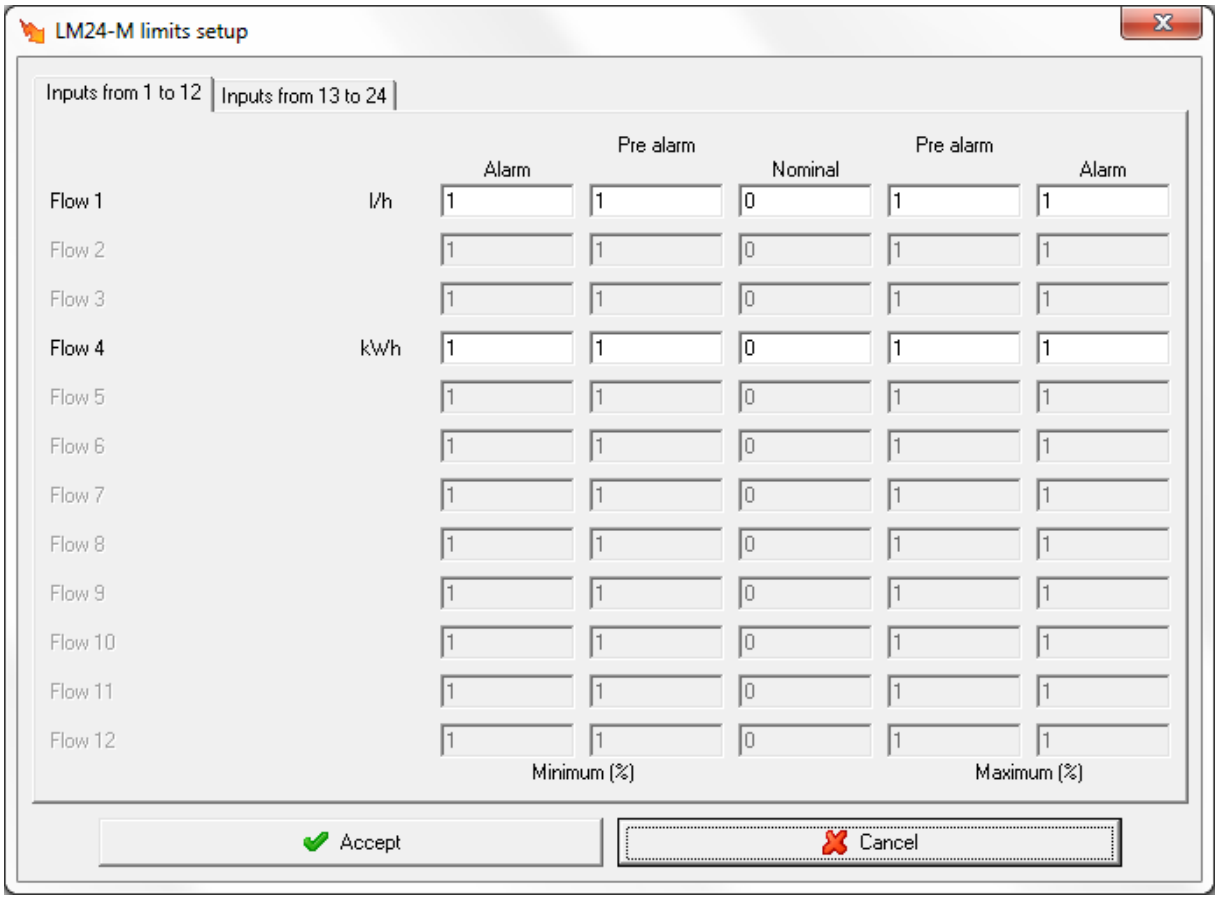
Finally for the flow configuration:



Checking the selector ☑ will activate the flow variable. Remember if the selector is not checked it will not be possible to view the flow value of the corresponding LM-24 M input.

- **Description:** Alphanumeric type data which permits a brief description of the flow to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the flow is shown to be entered.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device counter.

1.45.1.3 Variable limits



Limits can only be defined for flows that are enabled.

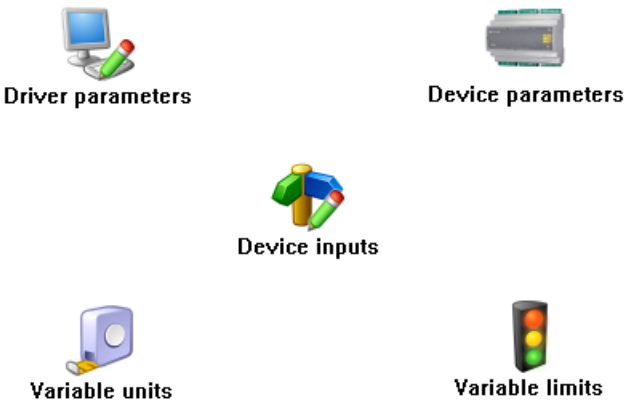
Through this dialogue the nominal value of flow type counters, as well as a series of margins to display on screen when a variable measures unusual values can be configured.

The *'Variable limits'* option is explained in detail in section 1.1.3 Variable limits.

1.46.- LM25- M

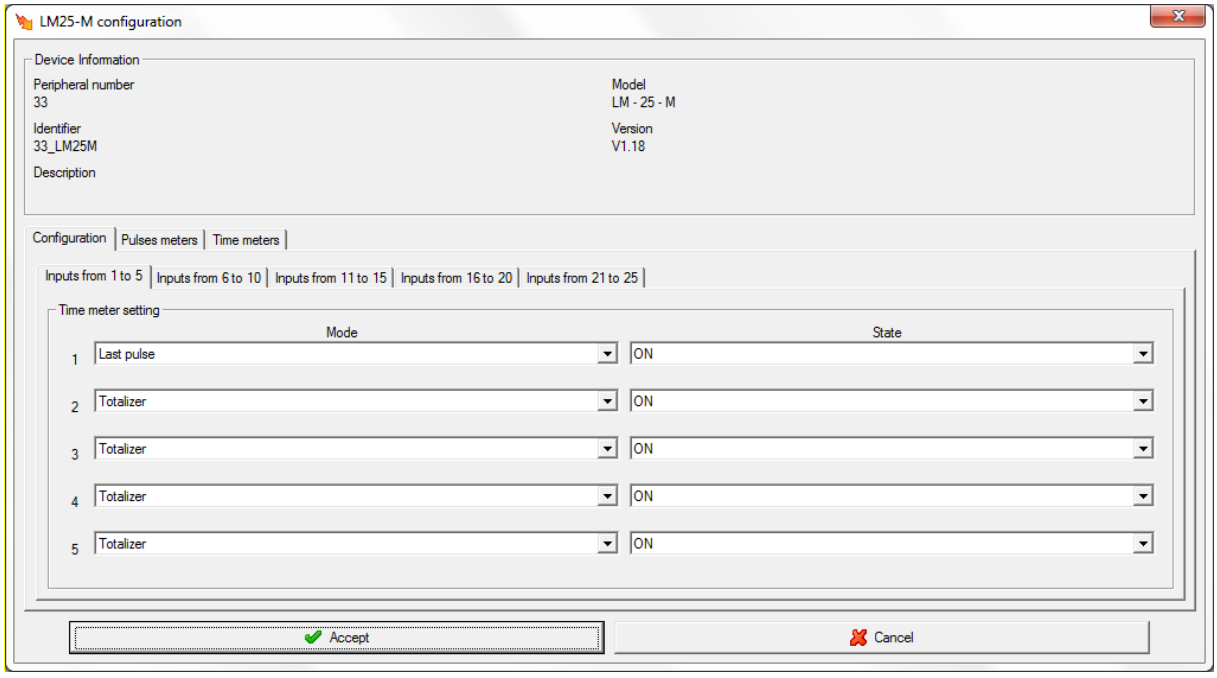
1.46.1 Driver options

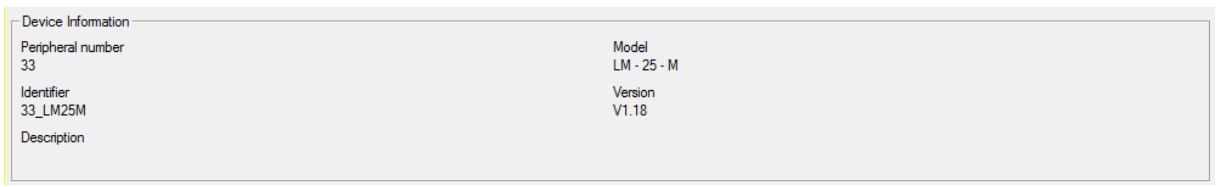
Options menu:



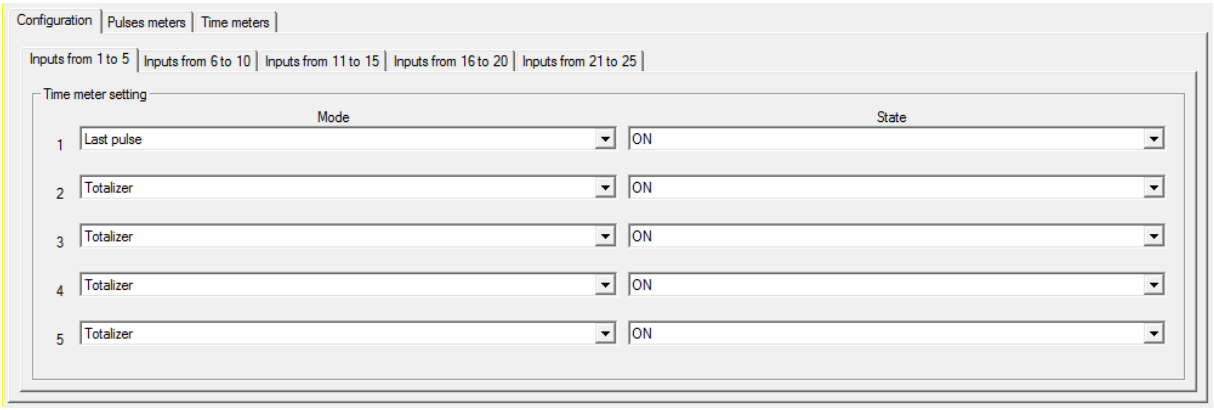
1.46.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. When the dialog box is opened, the software will read the device's configuration. When this procedure is complete, click on '*Accept*' and the software will send the information to the device if any changes have been applied. The information will never be stored on the hard drive of the PC.





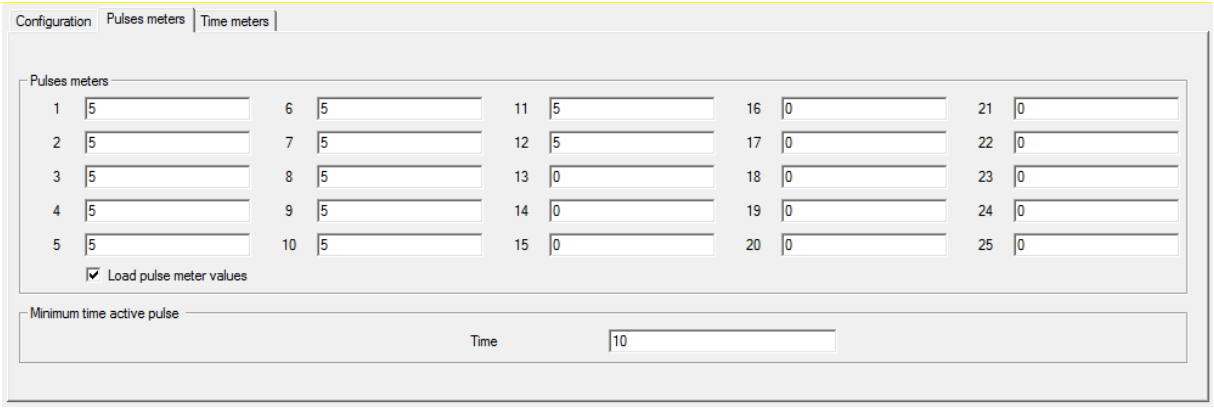
Displays general information.



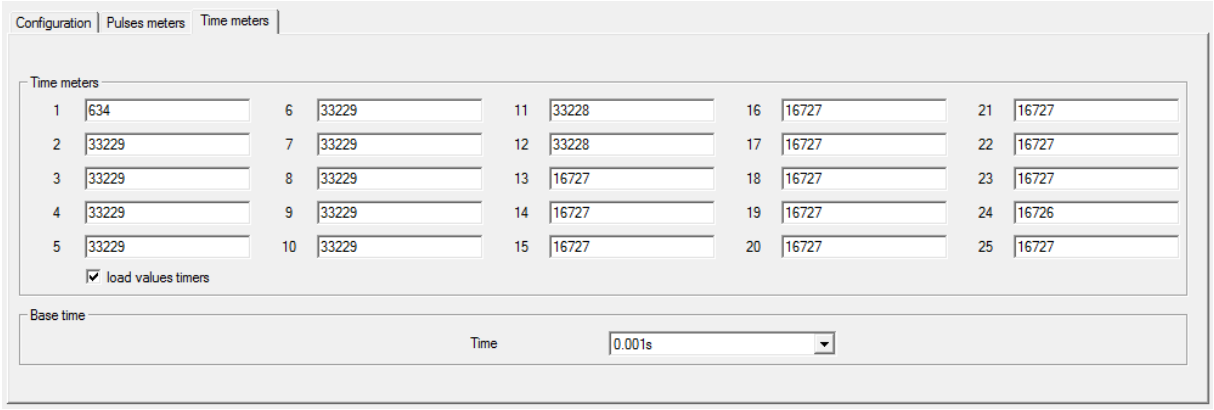
The operating mode and status of each input of the device and time meter can be defined on the 'Configuration' tab. Inputs are grouped in sets of 5 on each tab.

- Mode: Allows you to select 'Last pulse' or 'Totalizer'. The meter will be restarted with the last pulse after the metering actions are started and the totalizer will increase the value stored in the meter.

- Status: Allows you to select whether the meter operation starts with a contact on 'ON' or 'OFF'.


Configuration
Pulses meters
Time meters
Pulses meters
1 5 6 5 11 5 16 0 21 0
2 5 7 5 12 5 17 0 22 0
3 5 8 5 13 0 18 0 23 0
4 5 9 5 14 0 19 0 24 0
5 5 10 5 15 0 20 0 25 0
Load pulse meter values
Minimum time active pulse
Time 10

The 'Pulse meters' corresponds to the configuration of pulse meters. Check the selector ☑ when the configuration is sent to load the values entered into the corresponding checkboxes into the pulse meters. The minimum activated pulse time is also configured. The value will be 10 to 500 ms.

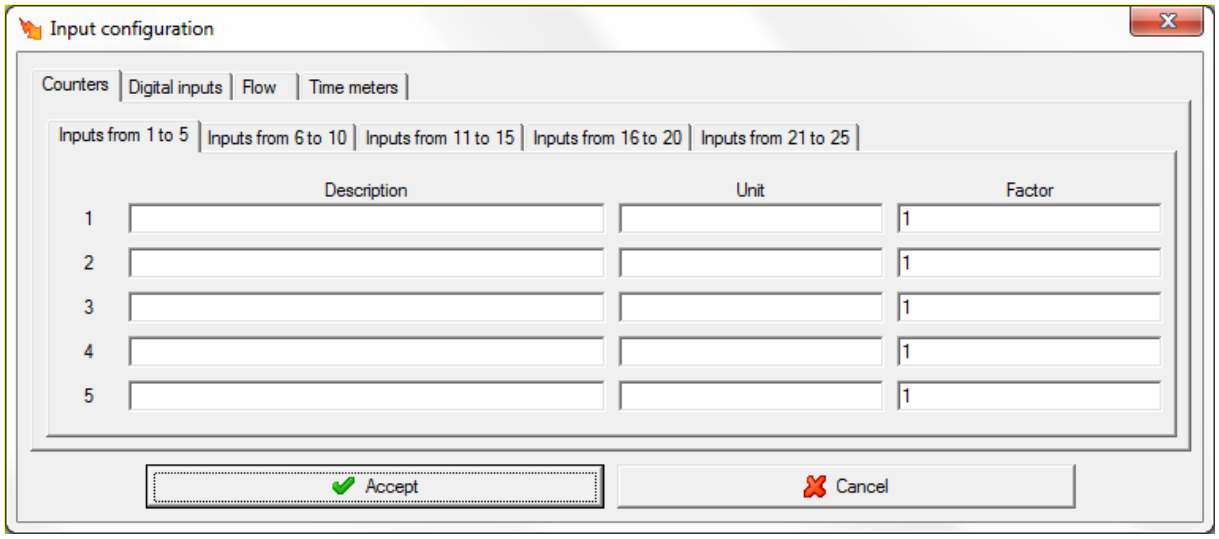


The 'Pulse meters' tab corresponds to the configuration of pulse meters. If the selector ☑ is checked, on sending the configuration the energy meter will be loaded with the values entered into the corresponding checkboxes. The meter's time base is also configured.

1.46.1.2 Device inputs

Four variables will be available for each of the LM25-M inputs, a digital value to show the input status (open / closed), a meter variable to show the number of pulses detected in the input, a time meter variable to show the time during which the input is activated and, finally, a flow variable calculated by the software as an estimate of the pulse frequency that occurs in the input during a period of time.

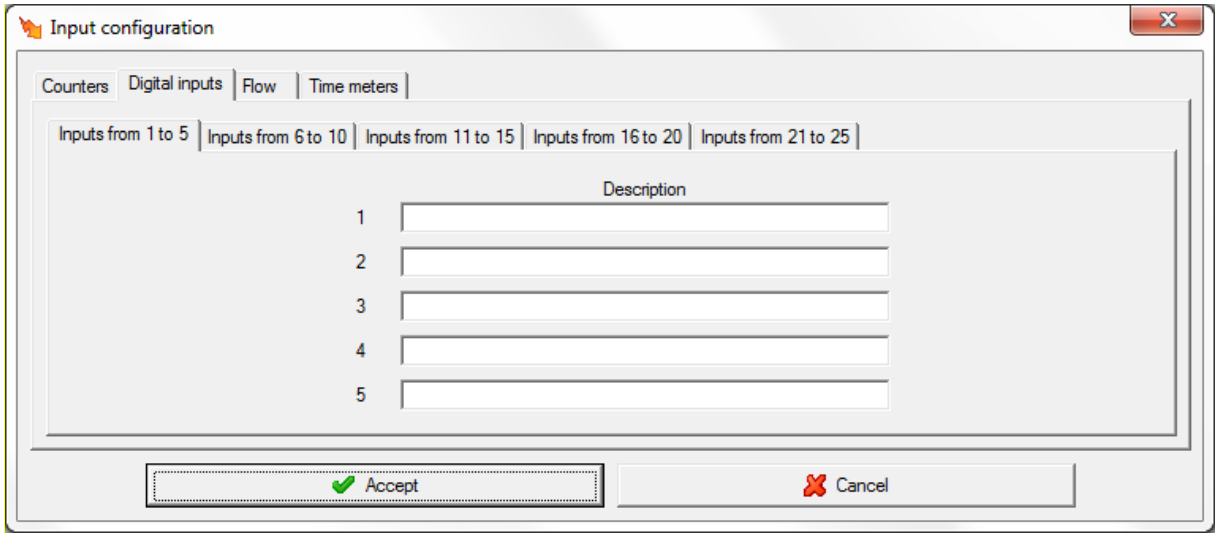
The LM25-M inputs can be configured on this dialog box:



Select the tabs to change the display of the configuration of the different types of variables which can be configured. The previous image shows the configuration of the meters, where:

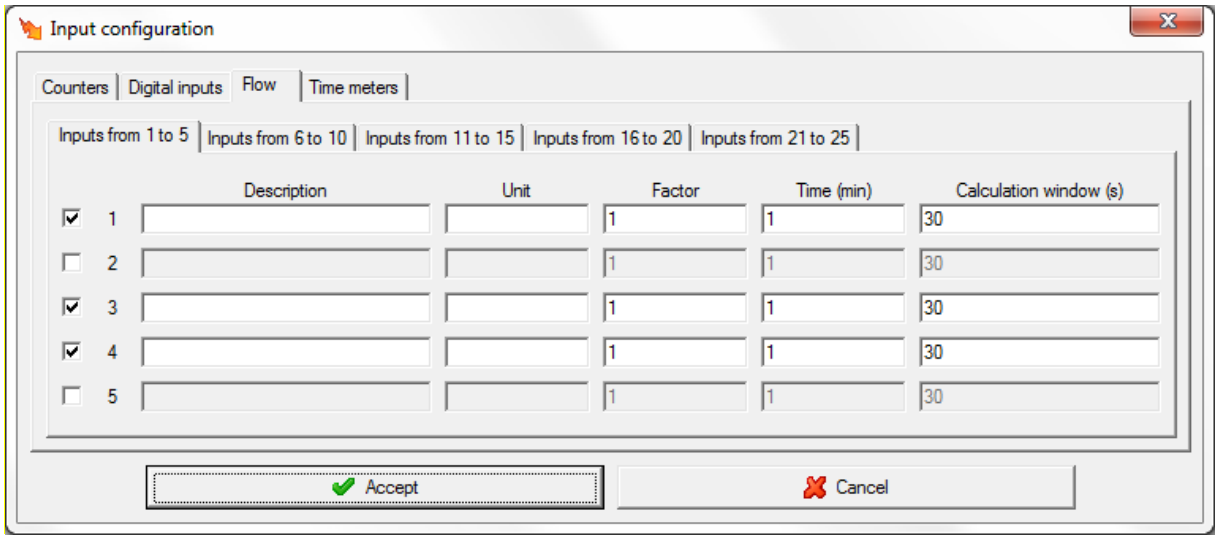
- **Description:** Alphanumeric data used to enter a brief description of the meter for a better identification.
- **Unit:** Alphanumeric data used to enter a brief description of the units on which the meter will be displayed.
- **Factor:** Multiplier value of each input pulse.

For the configuration of digital inputs,



- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

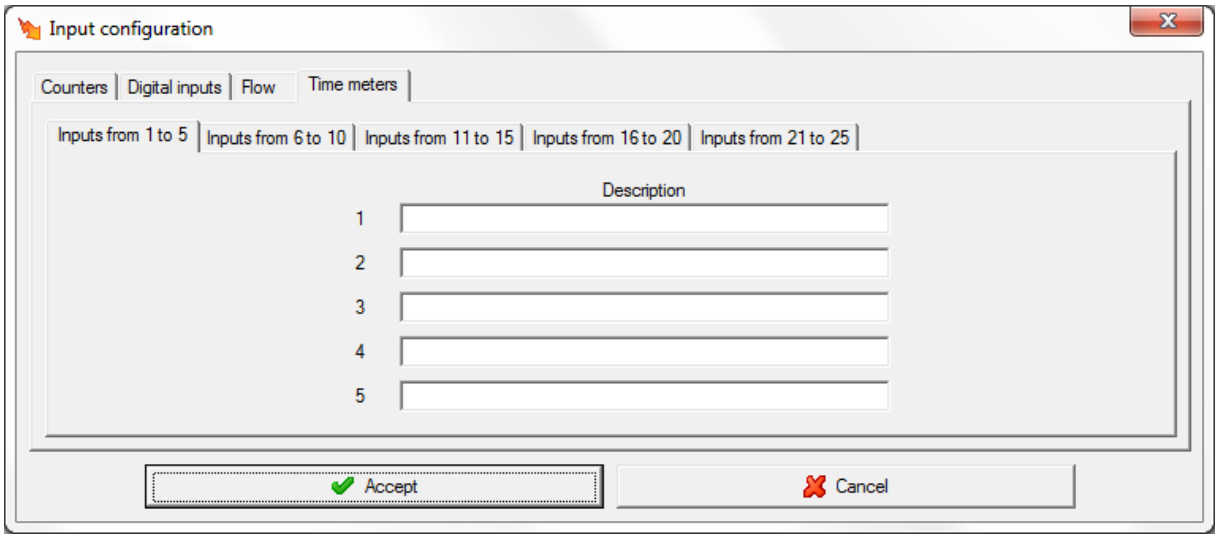
For the configuration of flows,



Checking the selector ☑ will activate the flow variable. Remember that if this selector is not checked, it will not be possible to display the flow value of the corresponding LM25-M input.

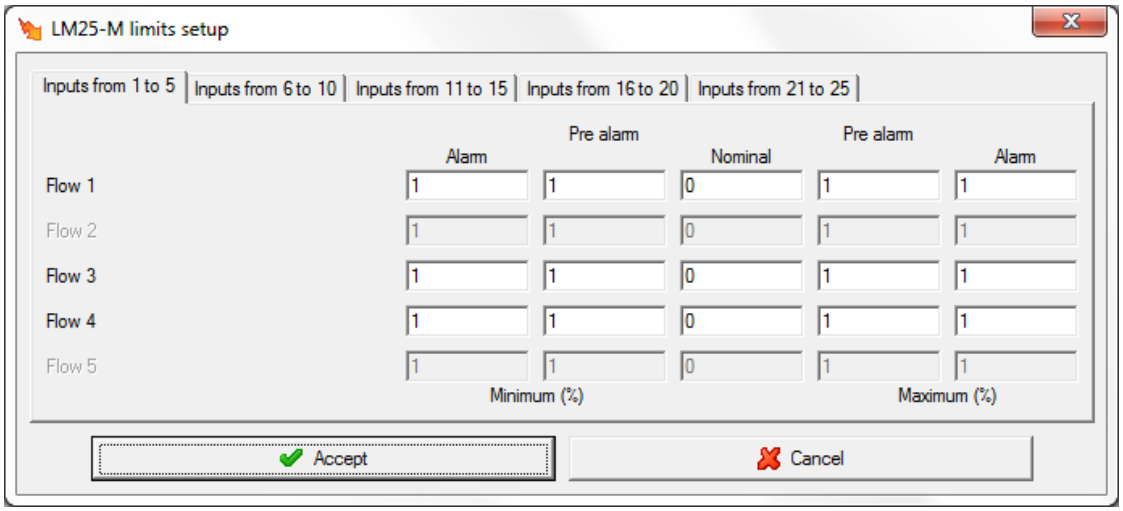
- **Description:** Alphanumeric data used to enter a brief description of the flow for a better identification.
- **Unit:** Alphanumeric data used to enter a brief description of the units in which the flow will be displayed.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device meter.

And, finally, the configuration of time meters,



- **Description:** Alphanumeric data used to enter a brief description of the time meters for a better identification.

1.46.1.3 Variable limits



Limits can only be defined for flows that are enabled.

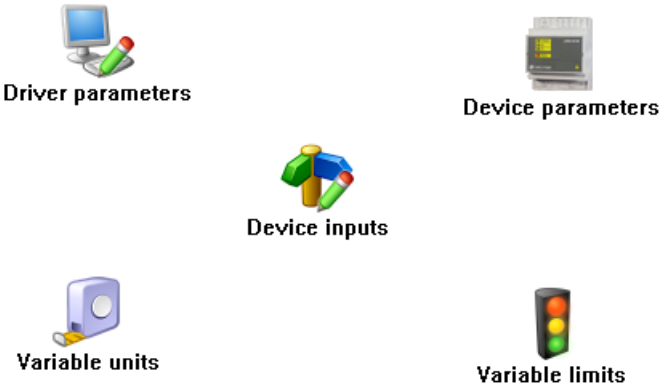
The nominal value of flow type meters, as well as a series of margins to display on screen when a variable measures unusual values can be configured with this dialog box.

The *'Variable limits'* option is described in section 1.1.3 Límites de las variables.

1.47.- LM4A-2IO-M

1.47.1 Driver options

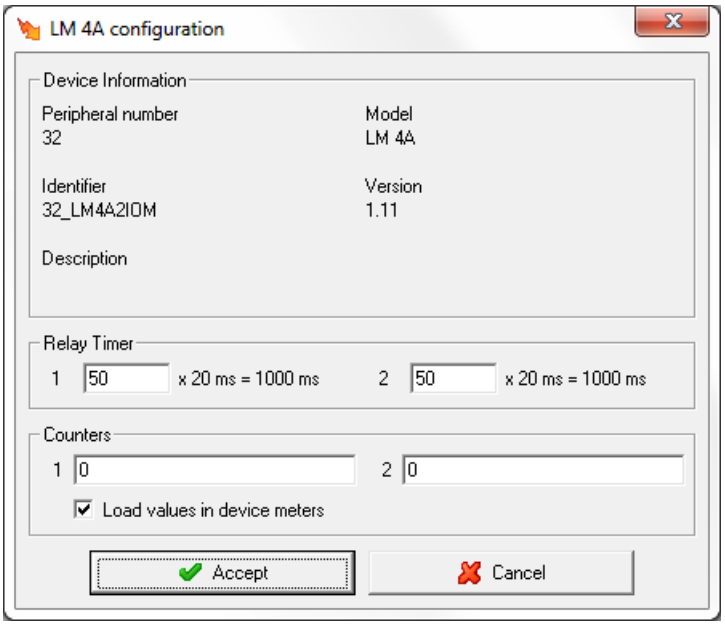
Options menu:

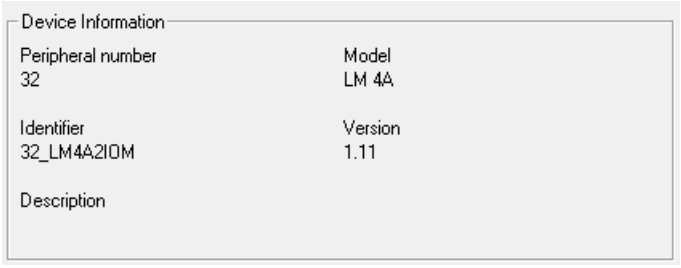


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

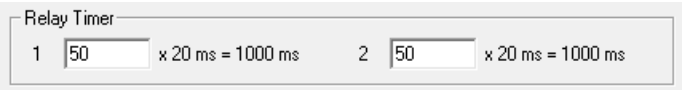
1.47.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "*Accept*" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

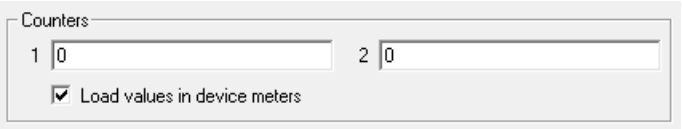




Displays general information.



Configuration of the pulse duration that can be generated with the digital outputs of the device.

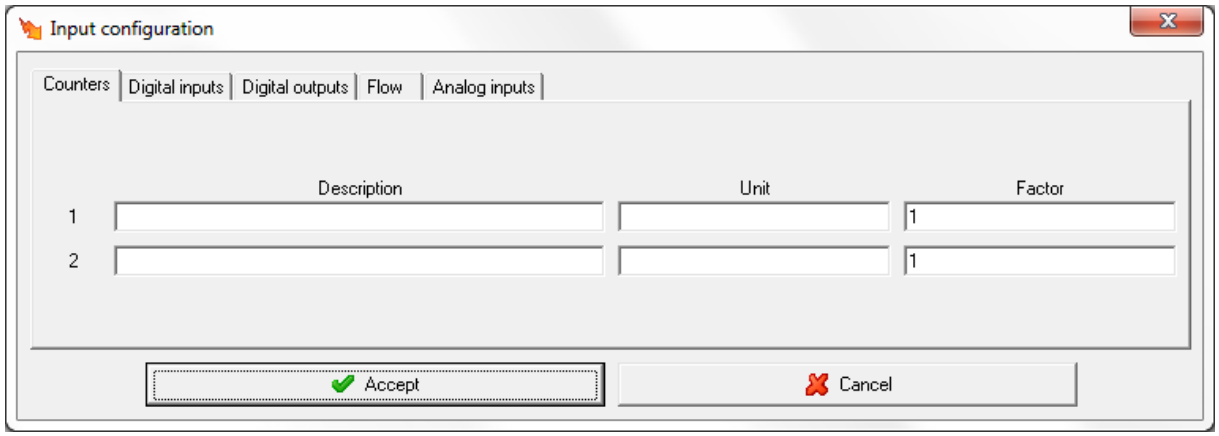


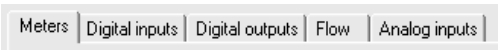
This part of the configuration corresponds to the device meters. If the selector ☑ is checked, on sending the configuration the energy meter will be loaded with the values entered into the corresponding boxes.

1.47.1.2 Device inputs

For each of the LM-4A inputs there will be three variables, one digital to display the input status (open/closed), a meter variable to display the number of pulses detected in the input and finally one flow variable calculated by the software as an estimation of the pulse frequency produced in the input within a period of time.

This dialogue box can be used to configure the LM-4A inputs and outputs.

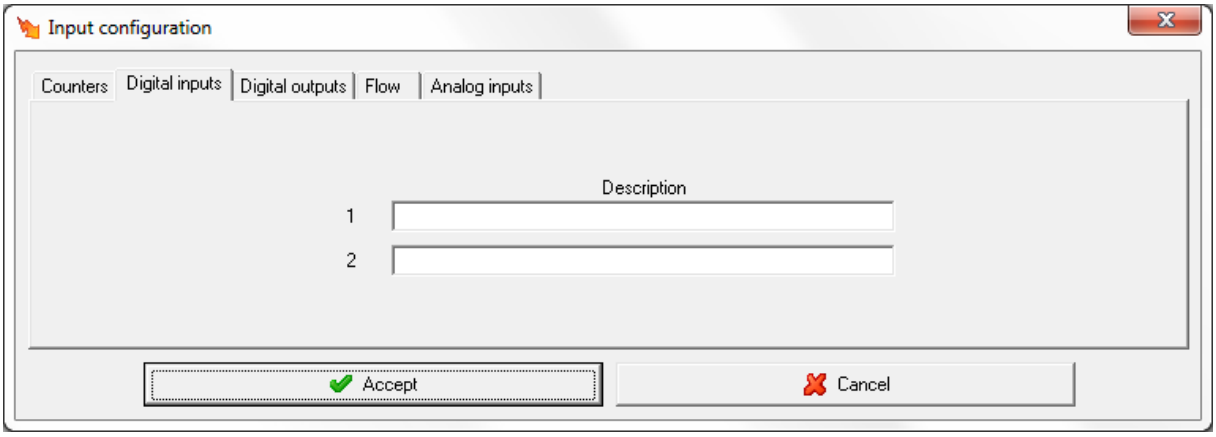


Use 

to change the display of the configuration of the different types of variables which can be configured. The previous image shows the configuration of the meters.

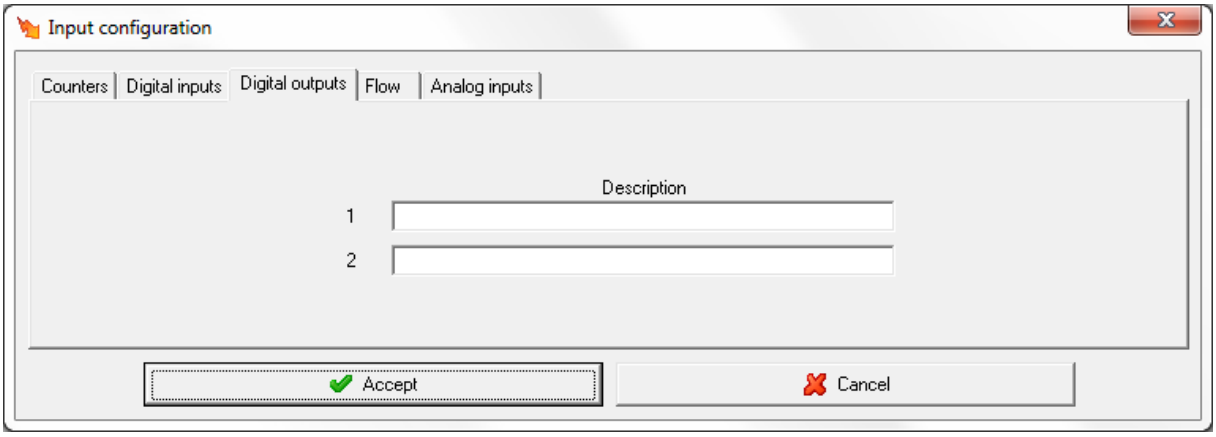
- **Description:** Alphanumeric type which permits a brief description of the meter so it can be identified better.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the meter is displayed to be entered.
- **Factor:** Multiplier value of each input pulse.

For digital inputs,



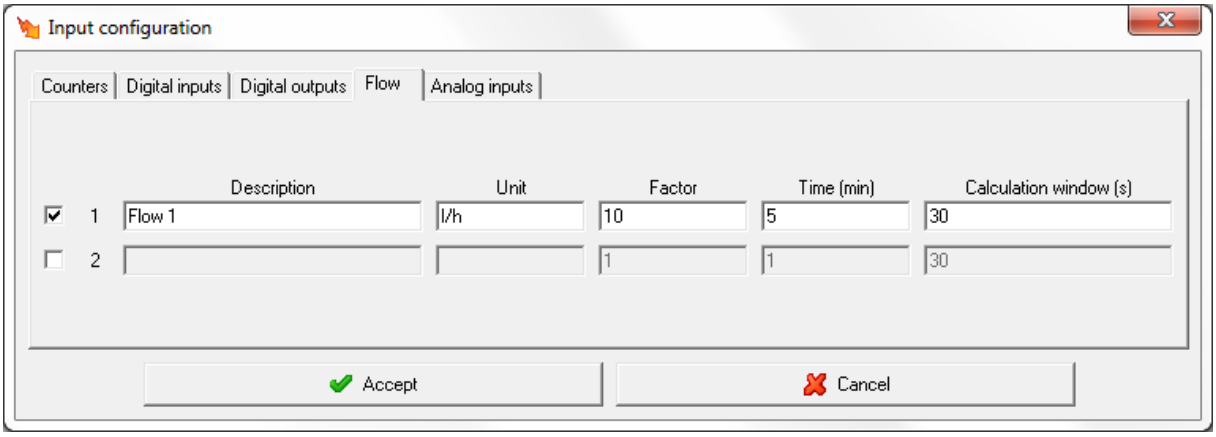
- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

For digital outputs,



- **Description:** Alphanumeric type data which permits a brief description of the digital output to be entered for better identification.

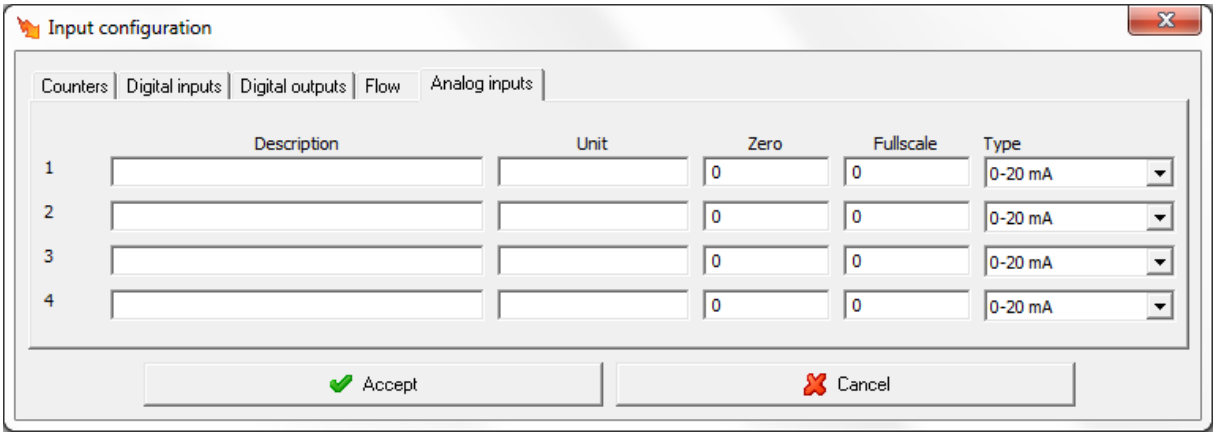
For the flow configuration,



Checking the selector ☑ will activate the flow variable. It must be remembered that if this selector is not activated it will not be possible to display the flow value for the corresponding LM-4A input.

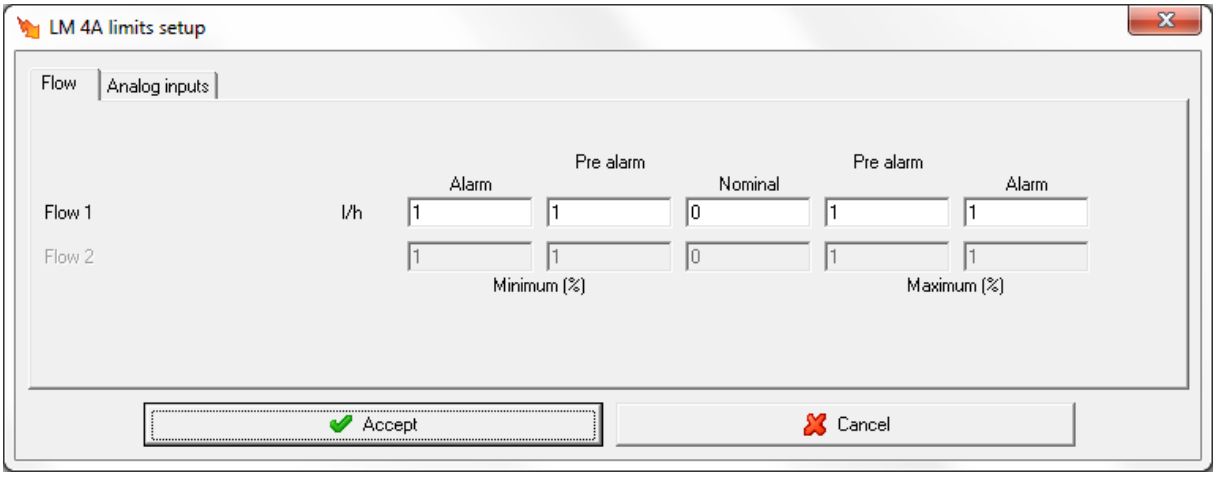
- **Description:** Alphanumeric type data which permits a brief description of the flow to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the flow is shown to be entered.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device meter.

Finally, for the analogue inputs,



- **Description:** Alphanumeric type data which allows a brief description of the analogue input for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the analogue input is shown to be entered.
- **Zero:** Starting value for the scale of the analogue input
- **Fullscale:** Maximum value for the scale of the analogue input
- **Type:** Type of input. Can be 0-20mA or 4-20mA. If it is 0-20mA, 0mA will correspond with the value indicated in “zero”, and 20mA with the value indicated in “Fullscale”. In the same way, an input of type 4-20mA, when it receives 4mA the value indicated in “zero” will be indicated, and in the case of 20mA the value in “Fullscale”.

1.47.1.3 Variable limits



Limits can only be defined for flows that are enabled.

Through this dialogue box, the nominal value of flow type meters, as well as a series of margins to display on screen when a variable measures unusual values can be configured.

The *'Variable limits'* option is explained in detail in section 1.1.3 Variable limits.

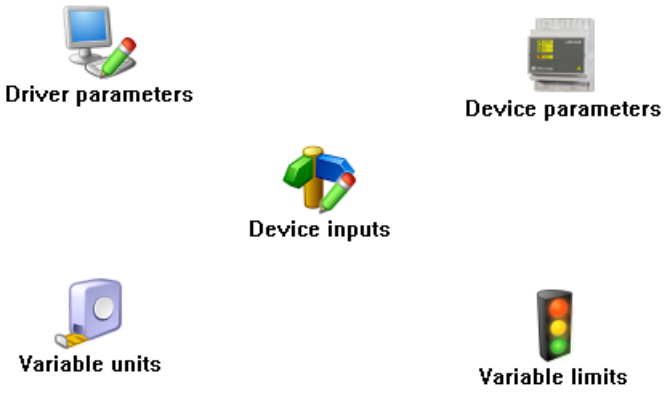
1.48.- LM4I-4O-M

1.48.1 Driver options

The LM4I-4O-M options can be accessed from:

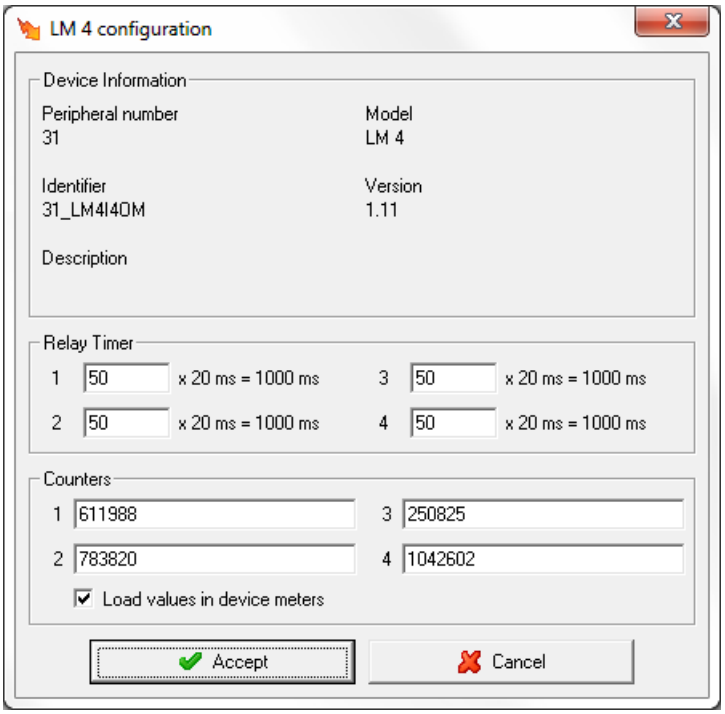
- *View Menu:* Refer to 'Editor manual'.
- *Toolbar*. Refer to 'Editor manual'.

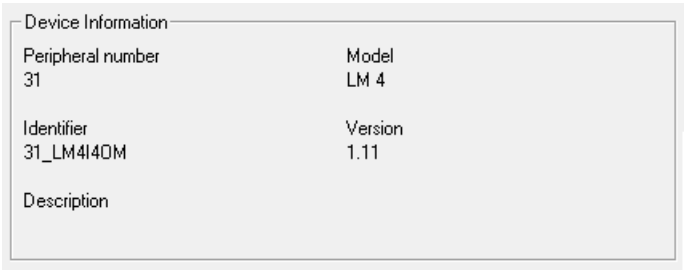
Options menu:



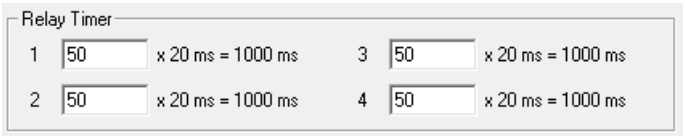
1.48.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "*Accept*" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

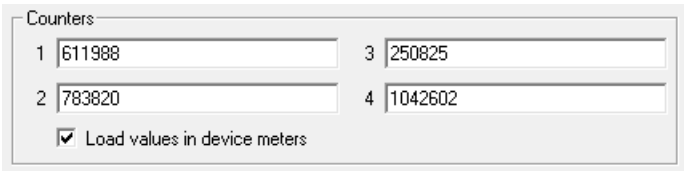




Shows general information.



Configuration of the pulse duration that can be generated with the digital outputs of the device.

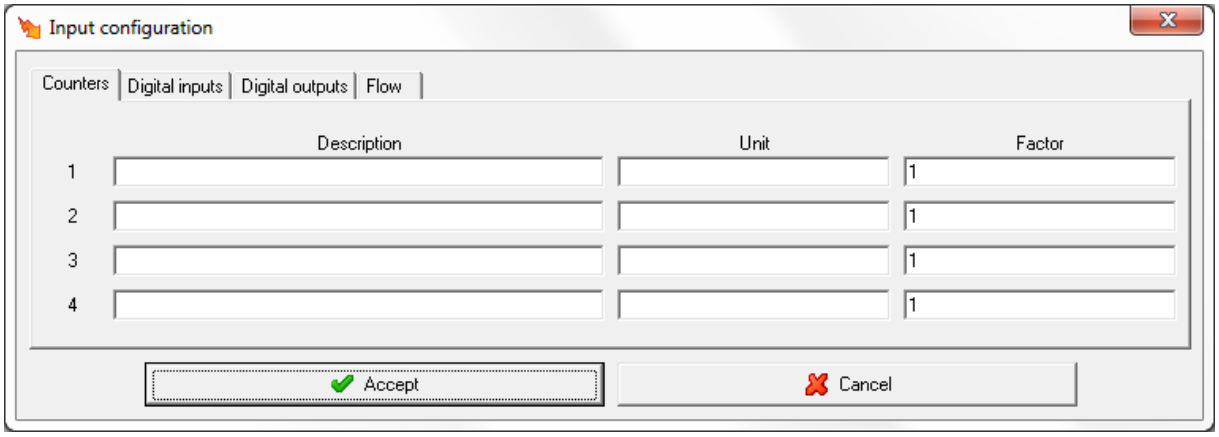


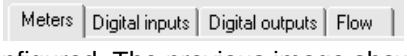
This part of the configuration corresponds to the device counters. If the selector is checked, on sending the configuration the energy counter will be loaded with the values entered into the corresponding boxes.

1.48.1.2 Device inputs

For each of the inputs of the LM4I-4O-M, three variables will be available: a digital display to show the status of the input (open / closed), a counter variable to show the number of pulses detected at the input, and finally a flow variable calculated by the software as an estimate of the pulse frequency on the input during a period of time.

Using this dialogue the inputs and outputs of the LM4I-4O-M can be configured,



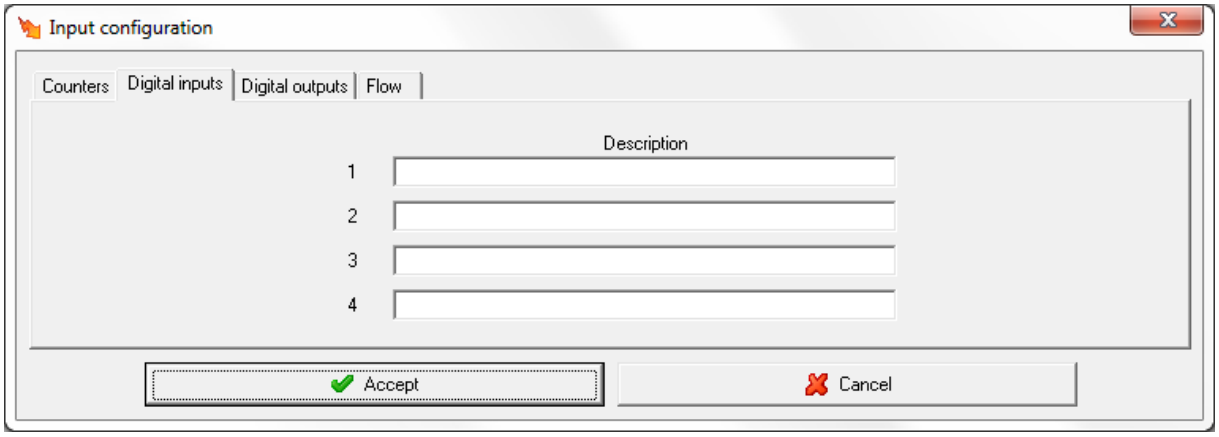
Using the 

display configuration of the different types of variables can be configured. The previous image shows the configuration of the counters, where:

- **Description:** Alphanumeric type which permits a brief description of the counter so it can be identified better.

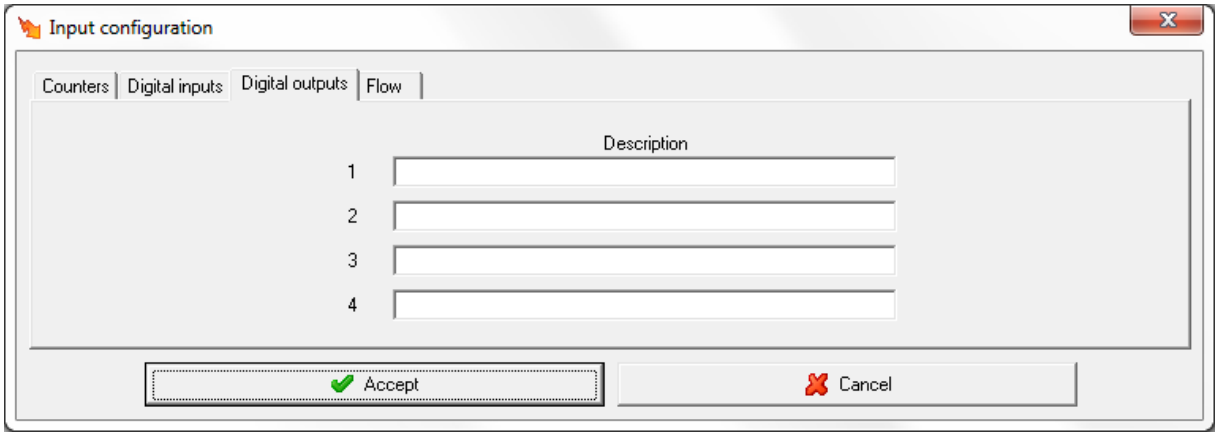
- **Unit:** Alphanumeric type data which permits a brief description of the units where the counter is displayed to be entered.
- **Factor:** Multiplier value of each input pulse.

For digital inputs,



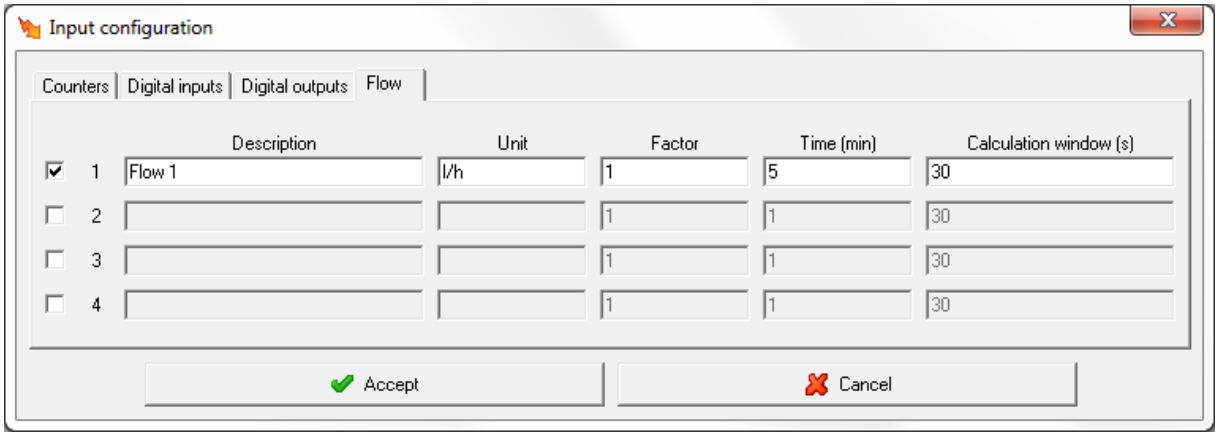
- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

For digital outputs,



- **Description:** Alphanumeric type data which permits a brief description of the digital output to be entered for better identification.

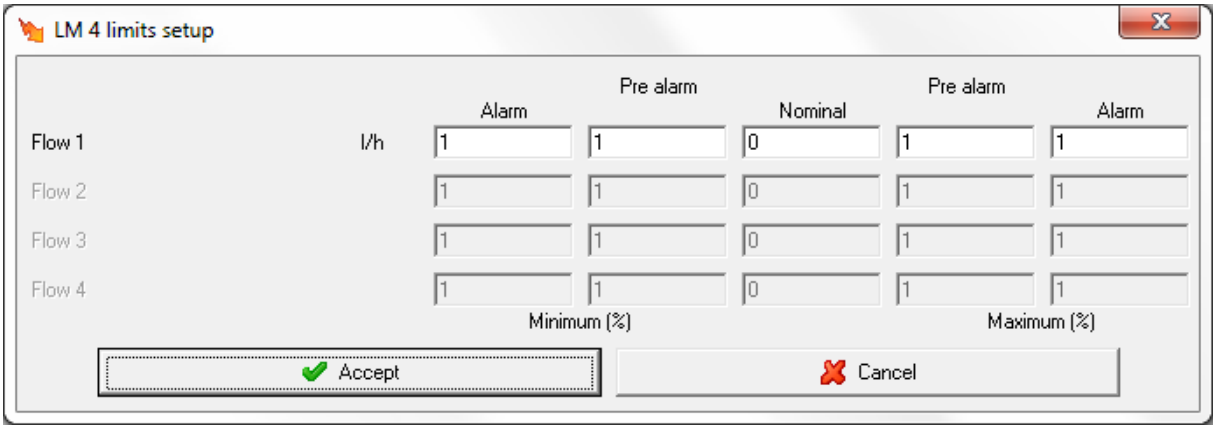
Finally for the flow configuration,



Checking the selector; will activate the flow variable. Remember if this selector is not checked it will not be possible to view the flow value of the corresponding LM4I-4O-M input.

- **Description:** Alphanumeric type data which permits a brief description of the flow to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the flow is shown to be entered.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device counter.

1.48.1.3 Variable limits



Limits can only be defined for flows that are enabled.

Through this dialogue the nominal value of flow type counters, as well as a series of margins to display on screen when a variable measures unusual values can be configured.

The *'Variable limits'* option is explained in detail in section 1.1.3 Variable limits.

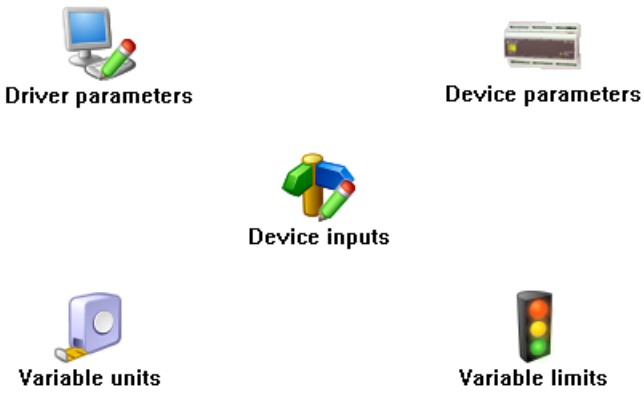
1.49.- LM50-TCP

1.49.1 Driver options

You can access the LM50-TCP options from:

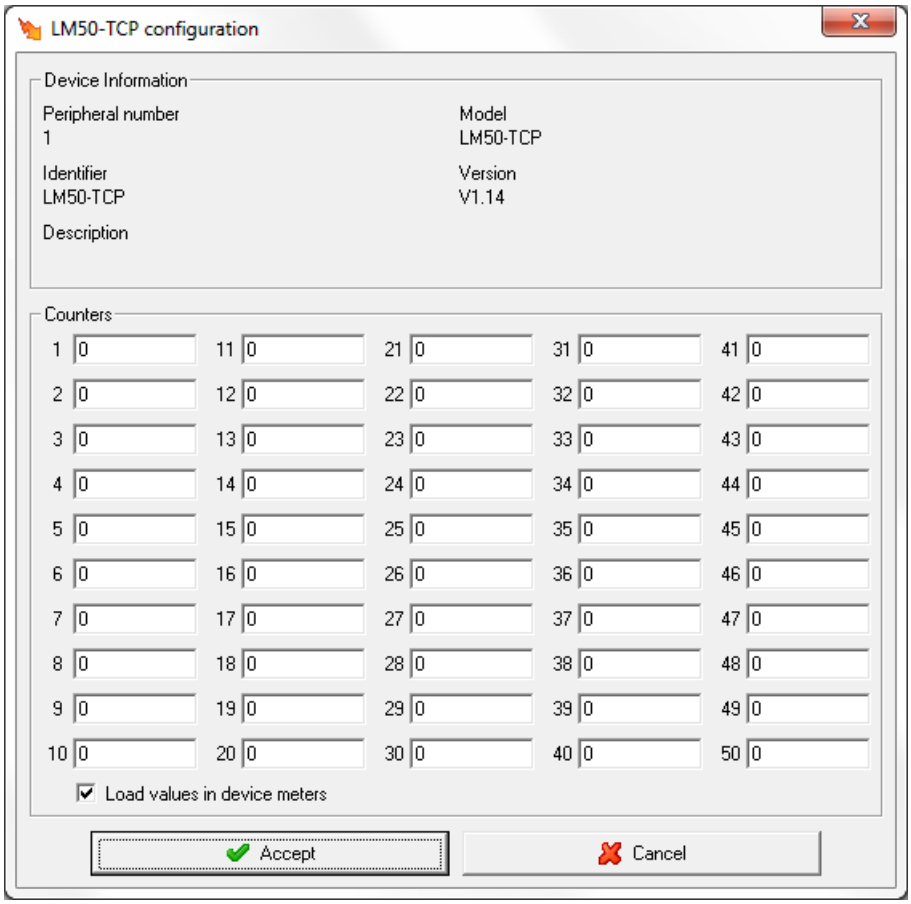
- *View Menu:* Refer to 'Editor manual'.
- *Toolbar*. Refer to 'Editor manual'.

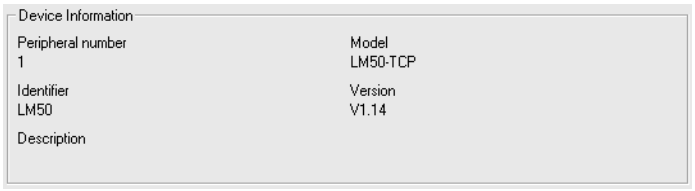
The following is the options menu:



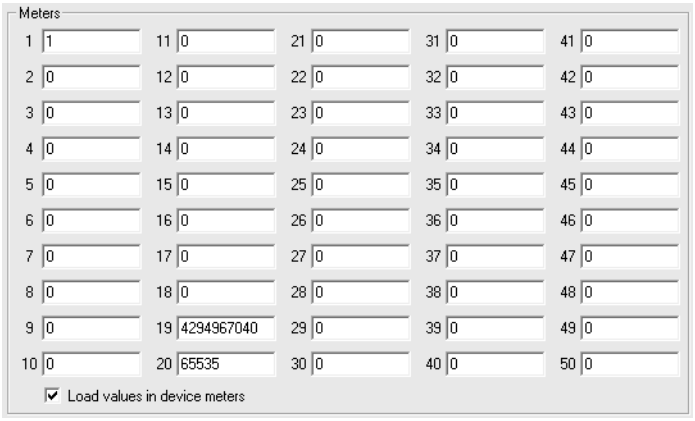
1.49.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.





Shows general information.

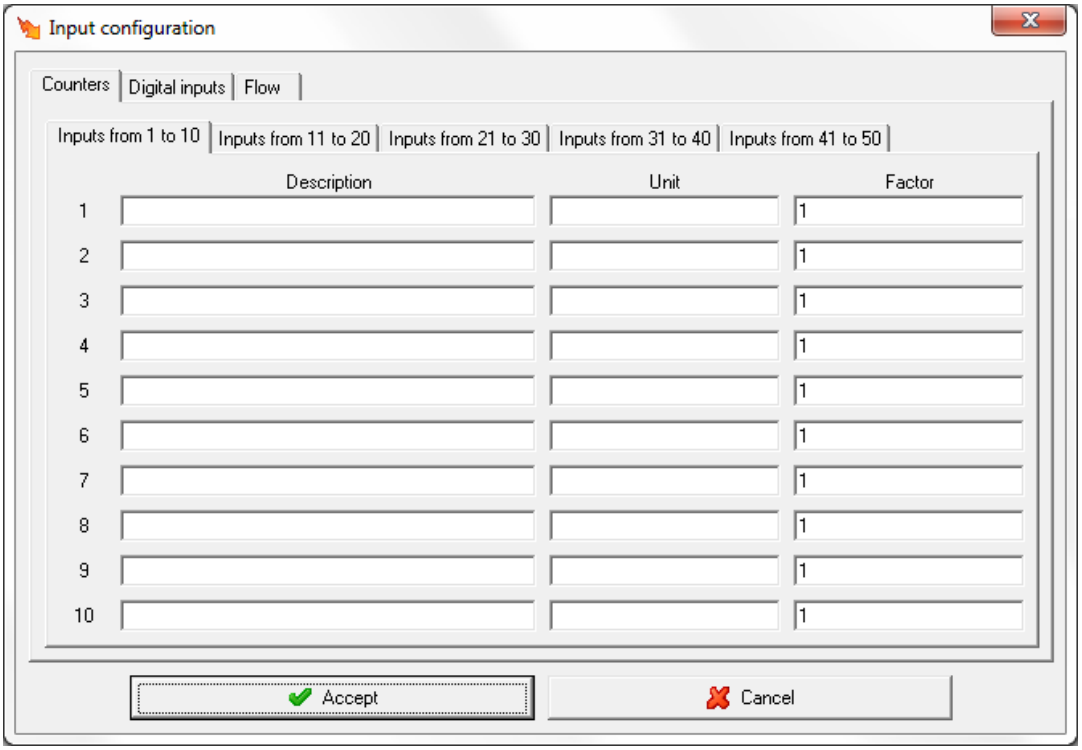


This part of the configuration corresponds to the device counters. If selector ☑ is checked, on sending the configuration the counters that have been modified will be loaded with the values entered into the corresponding boxes.

1.49.1.2 Inputs

For each of the LM50-TCP inputs three variables will be available, a digital one to show the input status (open / closed), a counter variable to show the number of pulses detected in the input and finally a flow variable calculated by the software as an estimate of the pulse frequency that occurs in the input during a period of time.

By means of this dialogue the LM50-TCP input can be configured,

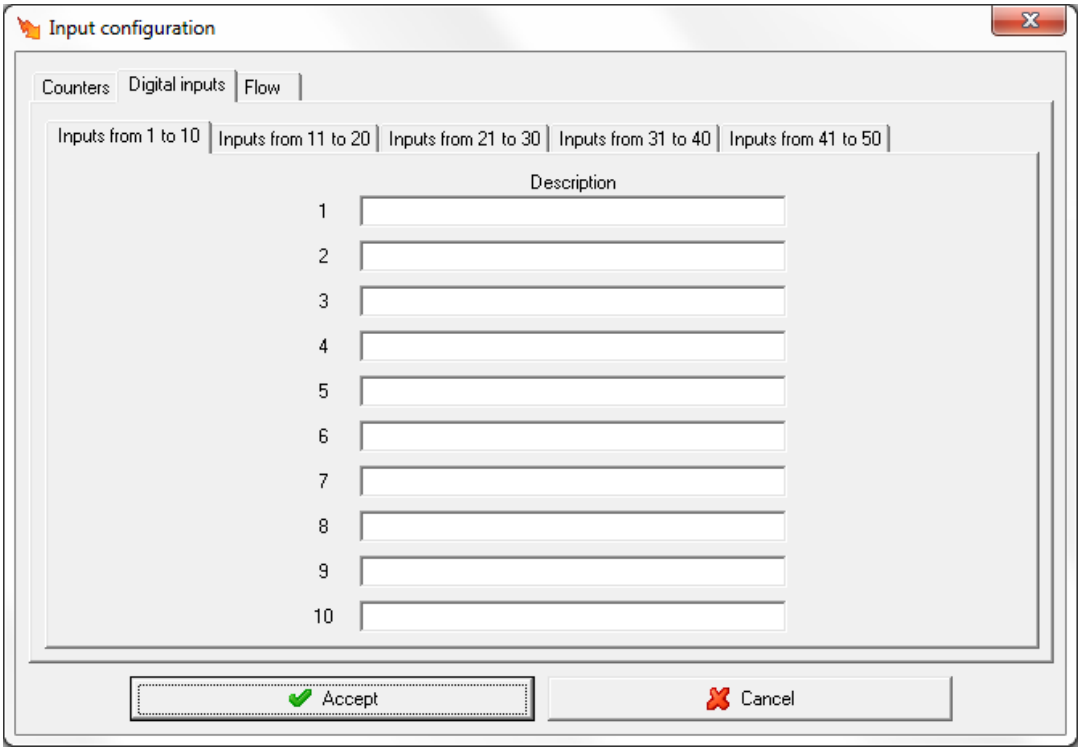


Using the

display configuration of the different types of variables can be configured. The previous image shows the configuration of the counters, where:

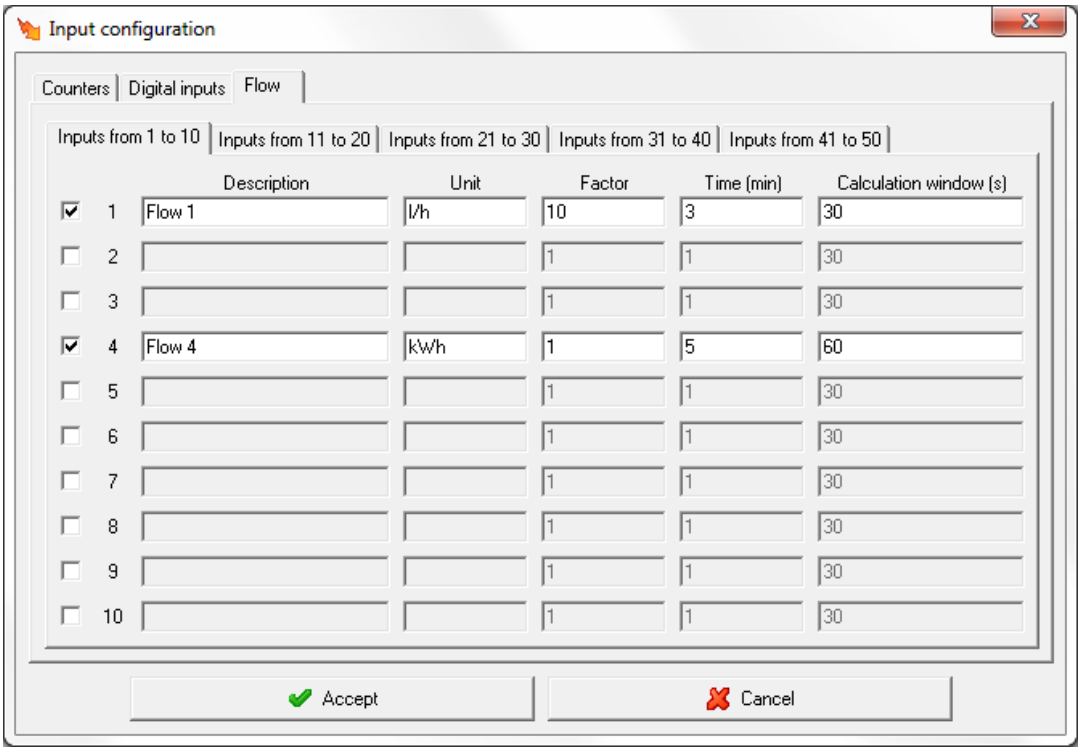
- **Description:** Alphanumeric type which permits a brief description of the counter so it can be identified better.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the counter is displayed to be entered.
- **Factor:** Multiplier value of each input pulse.

For digital inputs,



- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

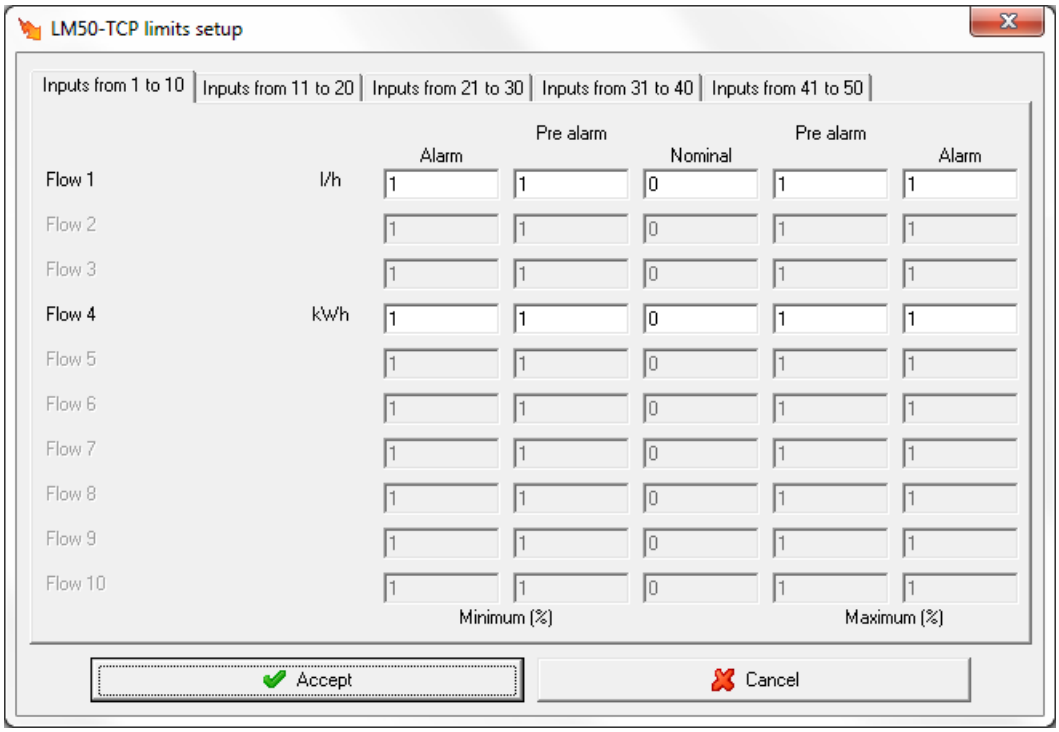
Finally for the flow configuration,



Checking the selector ☑ will activate the flow variable. Remember that if this selector is not checked it will not be possible to display the flow value of the corresponding LM50-TCP input.

- **Description:** Alphanumeric type data which permits a brief description of the flow to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the flow is shown to be entered.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device counter.

1.49.1.3 Variable limits



Limits can only be defined on flow type counters.

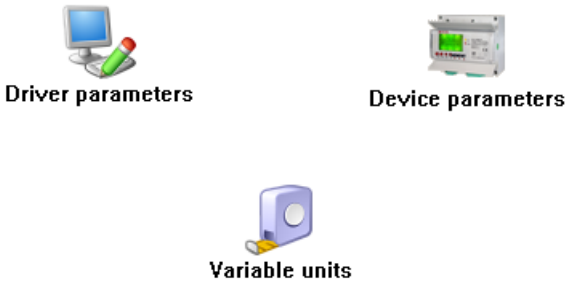
Through this dialogue the nominal value of flow type counters, as well as a series of margins to display on screen when a variable measures unusual values can be configured.

The *'Variable limits'* option is explained in detail in section 1.1.3 Variable limits.

1.50.- MKD

1.50.1 Driver options

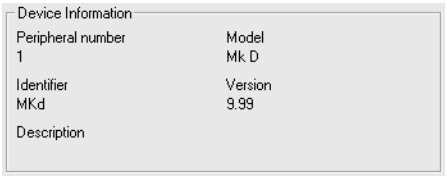
Options menu:



The *'Variable units'* option is detailed in section 1.1.2 Variable units.

1.50.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "*Accept*" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

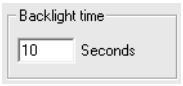


Shows general information.

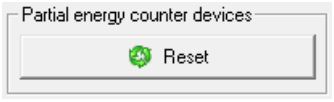
Device screen display options.

- **Omit reactive measurement:** The reactive measurements are not shown on the device screen, although they will continue to be displayed on the software display screens.
- **Omit partial counters:** Partial counter measurements are not shown on the device screen or the software display screen.

Flow direction

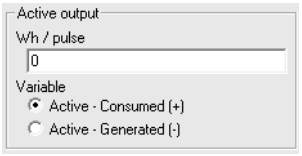


Configuration of the "*backlight*" disconnection. The value should oscillate between 0 and 10 seconds.

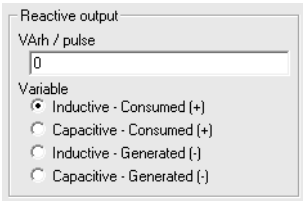


Click the button to start all the device partial counters.

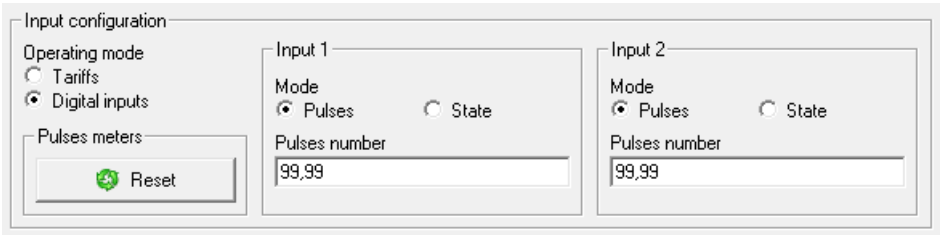
Configuration of the number of quadrants. With 2 quadrants only the consumed energy counters will be taken into consideration; with 4 both the consumed and generated energy counters will be considered.



Active energy output relay configuration. You may configure the number of Wh equivalent per output impulse and the variable that will be a measured to give this pulse. If the pulse value is 0, the output will be treated like a standard digital output, enabling its value to be forced from 0 to 1.

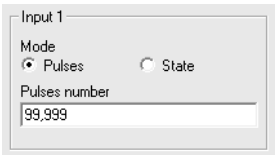


Reactive energy output relay configuration. The number of VArh equivalent per output pulse and the variable that will be a measured to give the pulse can be configured. If the pulse value is 0, the output will be treated like a standard digital output, enabling its value to be forced from 0 to 1.

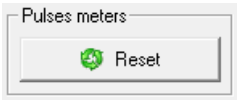


Configuration of the digital inputs of the device.

The inputs may be used as inputs for changing the rate or as digital inputs. Consult the device manual for more information on how changing the rate works



Configuration of one of the inputs when the operating mode is digital inputs. Inputs may be treated as pulse counters by selecting the '*Pulse*' mode; the parameter '*number of pulses*' will correspond to the multiplier factor of pulses counted at the input. When the selected mode is '*Status*' it will show the input status, open or closed, and will disable the corresponding counter.

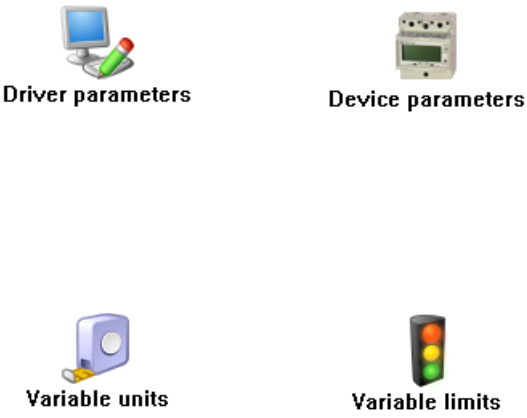


Clicking this button will reset the device counter. As long as the working mode is digital inputs and the input mode is configured in pulses.

1.51.- MK-LCD

1.51.1 Driver options

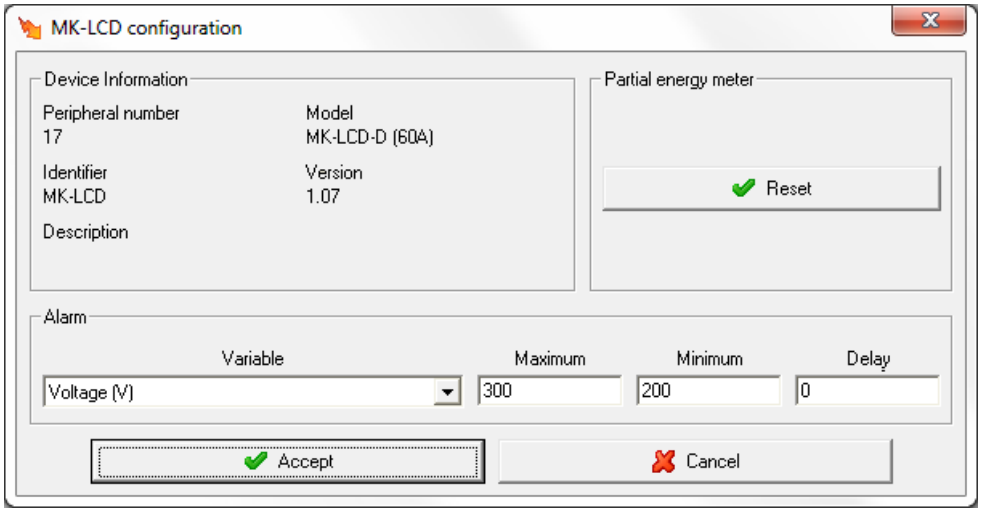
Options menu:

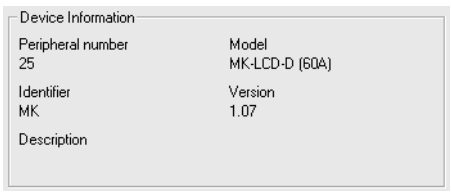


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

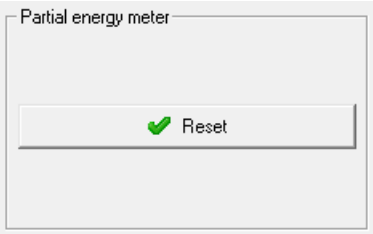
1.51.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

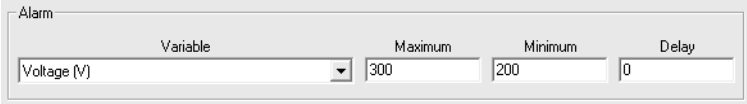




Shows general information.



Clicking the button will reset the partial power counter to zero.



This section shows the configuration of the device relay output and the option to configure it with the desired values is given.

- **Variable:** The parameters associated with the relay are indicated in this field. The output is programd as an alarm, and any of the parameters measured by the device can be controlled. The maximum and minimum alarm unit values are indicated in brackets.

- **Max:** This box indicates the maximum value to be controlled.

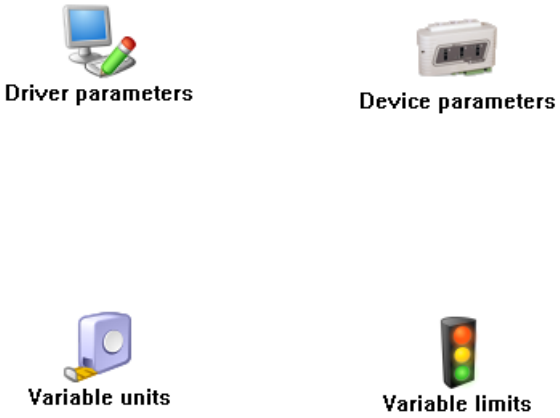
- **Min:** This box indicates the minimum value to be controlled.

- **Delay:** Alarm delay in seconds. The maximum value is 9999 seconds.

1.52.- MP3/MP4

1.52.1 Driver options

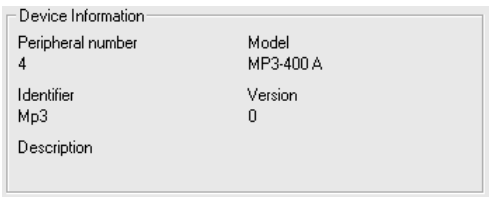
Options menu:



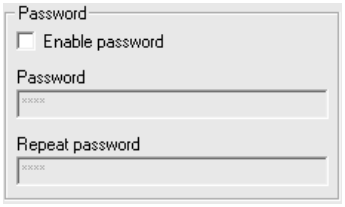
The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

1.52.1.1 Device parameters

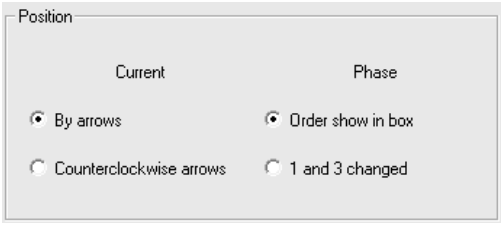
This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.



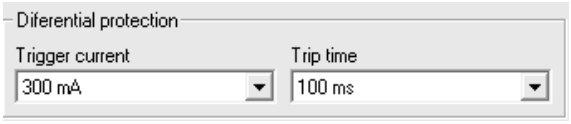
Shows general information.



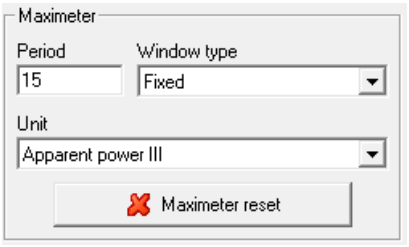
Enables the password to be enabled or deactivated to block the configuration of the device.



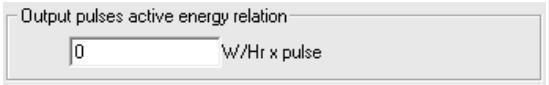
Configures the position of the device. The current as per the direction of the arrows, or its opposite, and the phases, as per the sequence shown on the box, or phases 1 and 3 swapped.



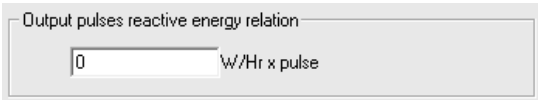
Configures the position of the device. The current as per the direction of the arrows, or its opposite, and the phases, as per the sequence shown on the box, or phases 1 and 3 swapped.



- **Period:** Is the integration period of the maximeter that can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value; this can be fixed or sliding.
- **Unit**: The maximum demand can be calculated with active power III, apparent power III, or phase current depending on the device.
- **Maximeter reset:** When the button is pressed, the device maximeter goes to zero.



Active energy output relay configuration. The relationship that will appear in the pulse output can be defined. Its value corresponds to the energy, in Wh, required to generate a pulse. If the pulse value is 0, it will be disabled.

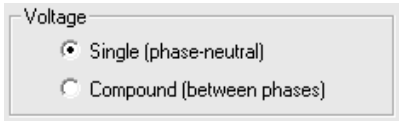


Reactive energy output relay configuration. The relationship that will appear in the pulse output can be defined. Its value corresponds to the energy, in Wh, required to generate a pulse. If the pulse value is 0, it will be disabled.

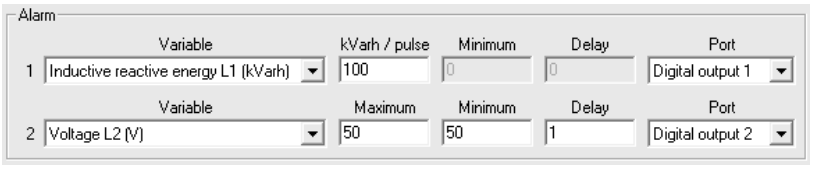
Option to define the pulse width at the pulse output.

Clicking the button will reset the device energy counters to zero.

Use to select the voltage line from which to read the frequency.



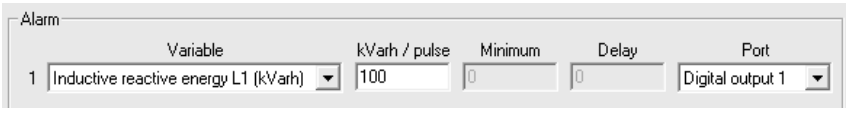
Selecting the type of voltage calculated.



This section shows the configuration of the device relay output, and the option to configure it with the desired values is given. For MP3/MP4 the relay outputs of these devices can be configured.

- **Variable:** The parameters associated with the relay are indicated in this field. The output is programd as an alarm or energy pulse with any of the parameters measured by the device being able to be controlled. The maximum and minimum alarm unit values are indicated in brackets.

- **Max:** This box indicates the maximum value to be controlled.If an energy variable is selected, the value of each pulse will be indicated. This will be displayed as follows:



- **Min:** This box indicates the minimum value to be controlled.If you select an energy variable, this field will remain disabled.

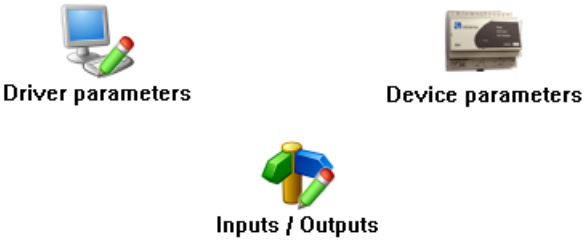
- **Delay:** Alarm delay in seconds. The maximum value is 9999 seconds.This field will remain deactivated if an energy variable is chosen.

- **Port**: Output port on which the alarm will be monitored.

1.53.- MR4

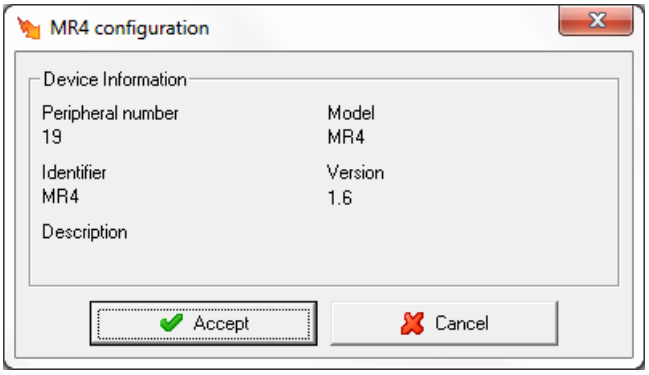
1.53.1 Driver options

Options menu:



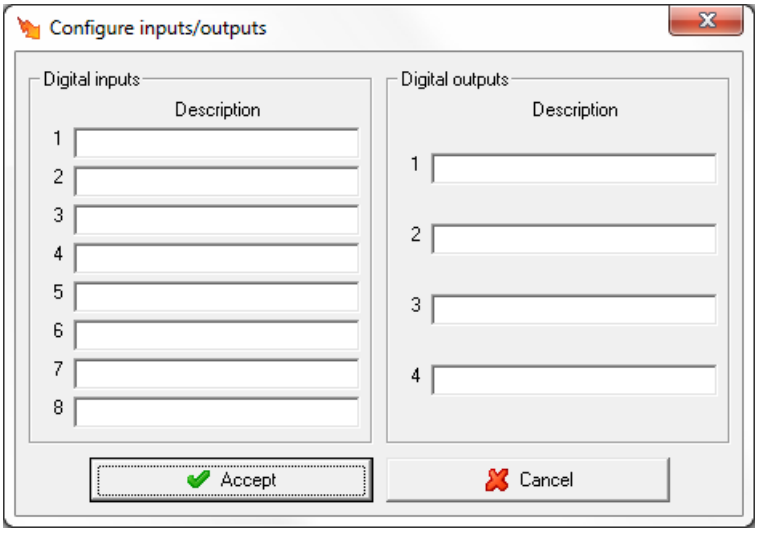
1.53.1.1 Device parameters

This screen shows general information.



1.53.1.2 Inputs / outputs

This screen allows for names to be assigned to the digital inputs and outputs.



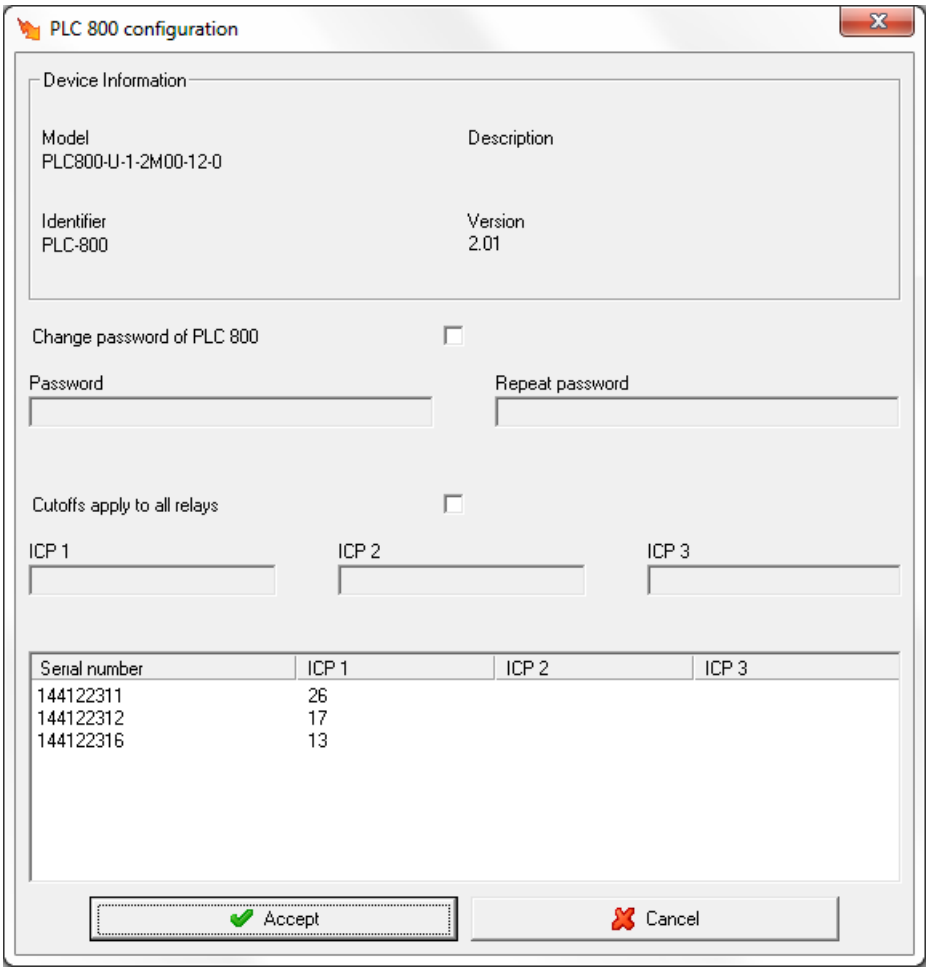
1.54.- PLC800

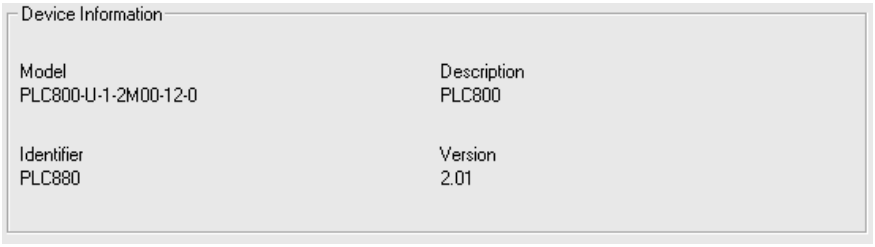
1.54.1 Driver options

The device options are as follows:

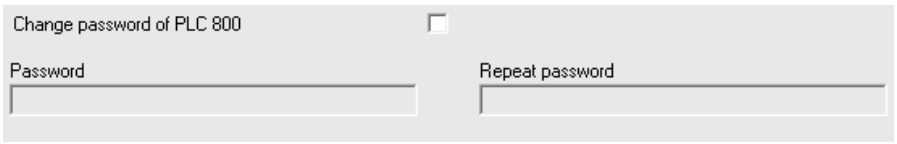
1.54.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. The information will never be stored on the hard drive of the PC.



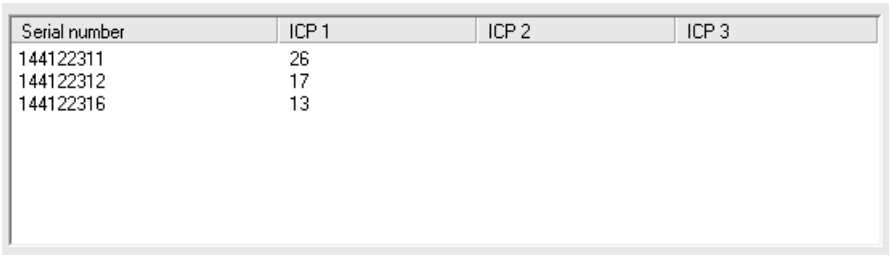


Displays general information.



It allows you to change the password with which you connected to the PLC800. The user acts as the concentrator, but you must check the last version of the device manual in case it has changed.

Allows you to assign the same cut-off current to all devices communicating with the PLC800 at the same time. Simply check on “Apply cut-off values to all relays” and the checkboxes of the three currents will be enabled (ICP1, ICP2, ICP3). At the same time, the independent assignment of currents is disabled. Any device that does not use all three cut-off currents will configure those used by the device.



If the previous option has not been selected on the table above, it will remain active to change the desired cut-off currents (ICP). Simply click on the desired row and column and the cell will change so that it can be edited. You cannot click on empty cells This indicates that the device does not use this type of cut-off current. The image shows the units in which only the first cut-off current can be configured. Take into account that the list only shows the devices with which the PLC800 has recently established communications.

Cut-off currents can only have whole values in Amps.

Update.

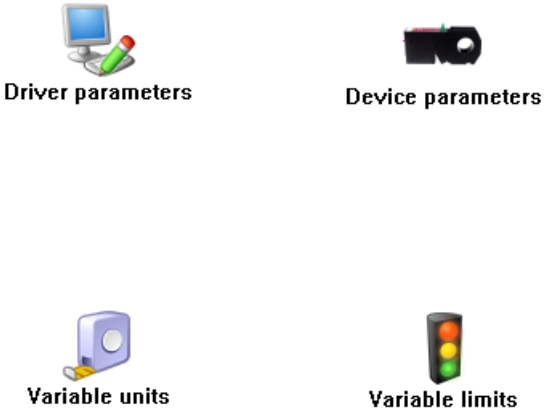
Clicking on this button will force the PLC800 to retrieve all registered devices and their status. Therefore, the editor can assist in some tasks, such as displaying the serial numbers or units connected to the PLC800 when using the wizard that adds variables. To do so, the editor must be communicating with the engine and the engine must be communicating with the PLC800.

Important note: The PLC800's operation is such that it does not allow the user to view the values of the unit variables hanging below in real time. Such as, for example: voltage, current, energy, etc. These values are downloaded by the PLC800 at regular intervals. Every 15 minutes by default.

1.55.- POWER NET

1.55.1 Driver options

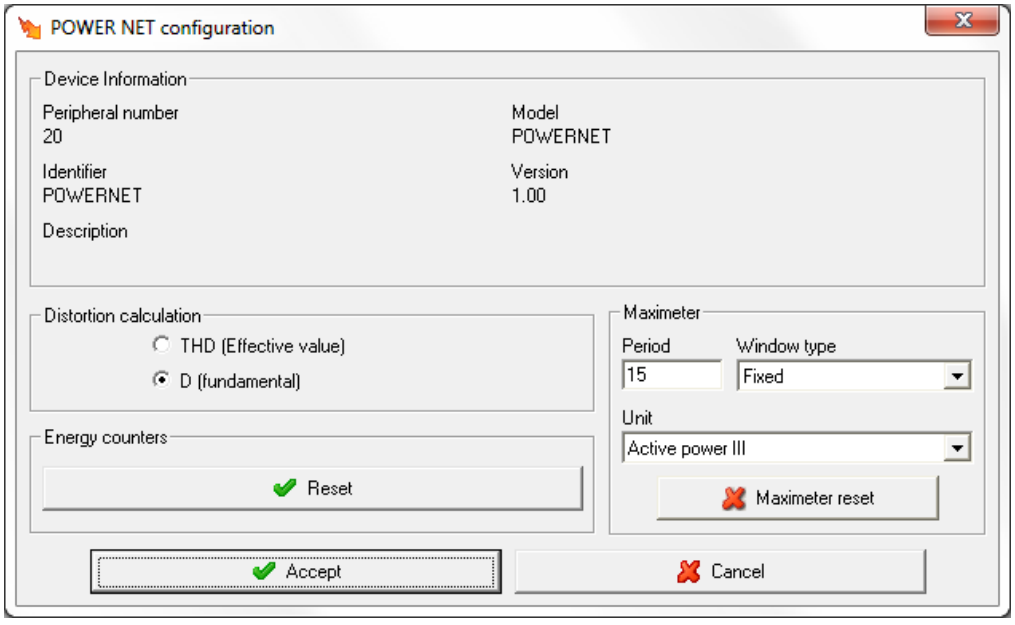
Options menu:

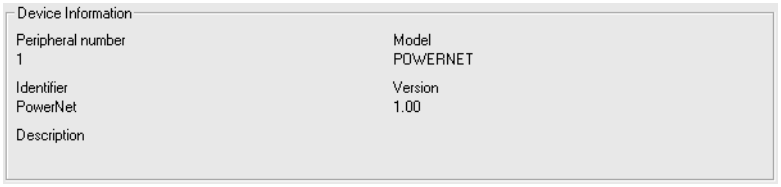


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

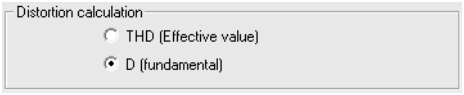
1.55.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

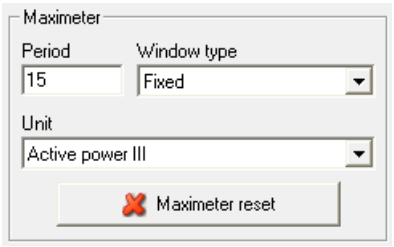




Shows general information.



Use this selector to configure the type of distortion the device will calculate.



Maximum demand will be activated in PowerNet devices with version 1.01 or higher of firmware.

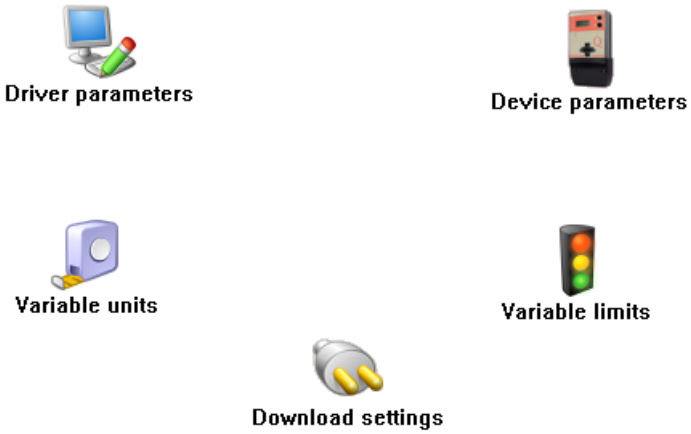
- **Period:** This is the maximeter integration period and can vary between 1 and 60 minutes.
- **Window type:** Type of window used to save the maximeter value, this can be fixed or sliding.
- **Unit**: The maximum demand can be calculated with active power III, apparent power III, current III or current by phase depending on the device.
- **Maximeter reset:** When the button is pressed, the device maximeter resets to zero.

Clicking the button will reset the device energy counters to zero.

1.56.- QNA -412/413

1.56.1 Driver options

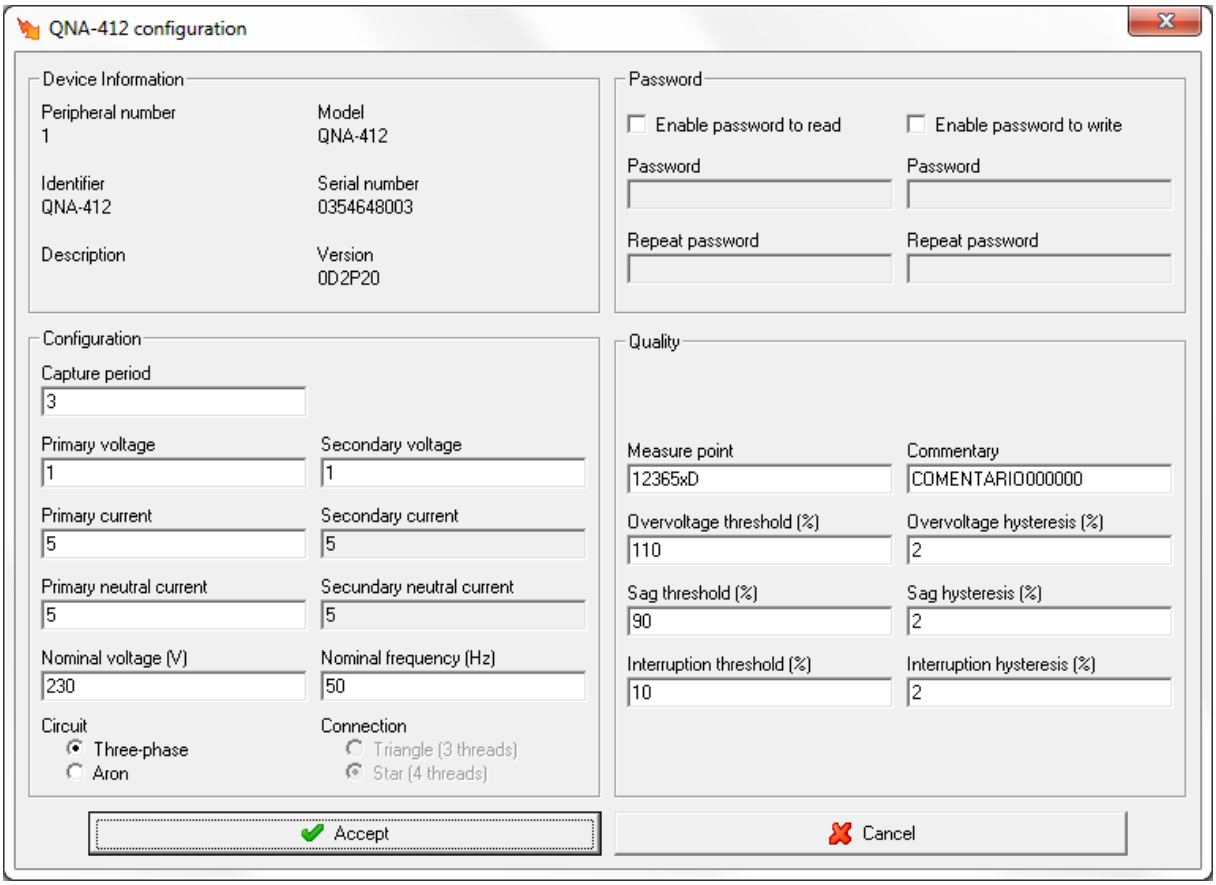
Options menu:

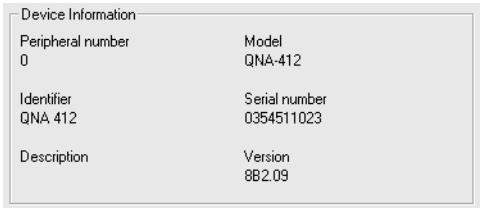


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

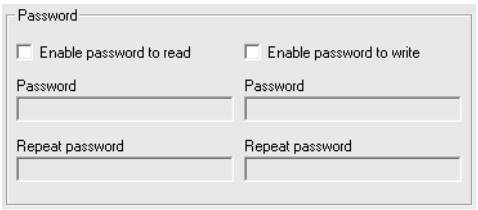
1.56.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

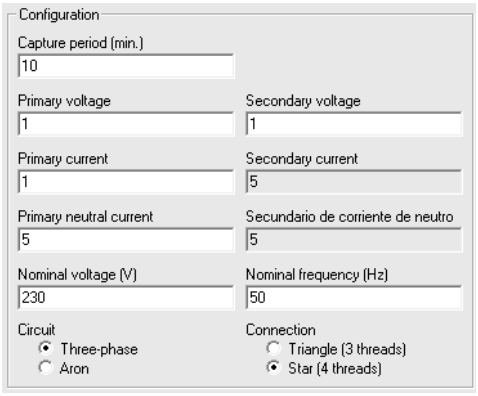




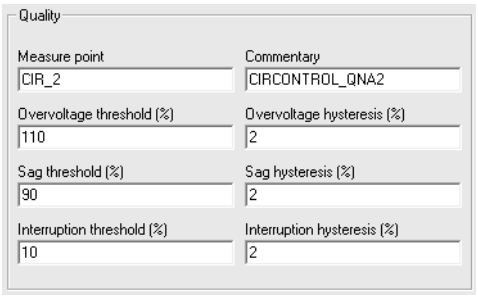
Shows information on the device.



Allows the password to be enabled or disabled to block both the reading and writing values and the configuration of the device.



- **Capture period:** Configuration in minutes between records stored on the device.
- **Primary voltage:** Device primary voltage value.
- **Secondary voltage:** Device secondary voltage value.
- **Primary current:** Device primary current value.
- **Secondary current:** Device secondary current value.
- **Neutral primary current:** Device neutral primary current value.
- **Neutral secondary current:** Device neutral secondary voltage value.
- **Rated voltage:** Rated voltage of the equipment, with a 3-wire configuration the composite voltage should be programd and the single voltage on four wires. If the measurement is carried out through voltage transformers, the programd value must refer to the secondary.
- **Nominal frequency:** Nominal frequency of the device.
- **Circuit:** Enables the type of circuit to which it is connected to carry out the measurement to be chosen, whether it is connected to a three-phase device or if it only uses two current connectors for the measurement (Aron).
- **Connection:** Enables the type of connection to which it is connected to carry out the measurement to be chosen, whether delta (connection between phases, without neutral) or star (3-phase connection and neutral)



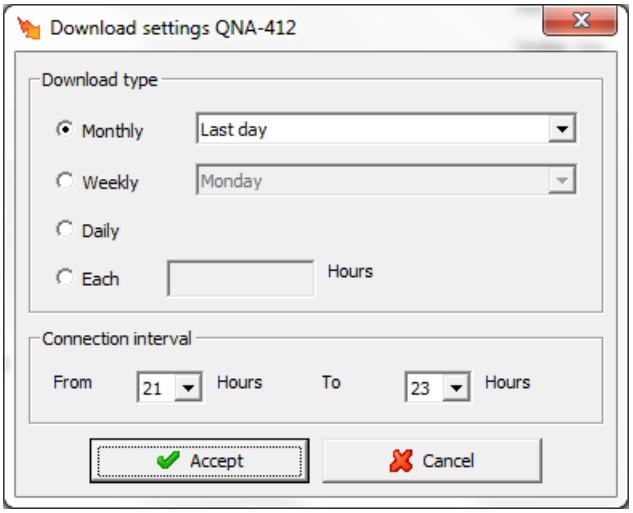
- **Measurement point:** Brief description of the measurement point where the QNA is situated
- **Comments:** Brief description of the measurement point.
- **Overvoltage threshold:** Serves to program the overvoltage percentage. Each semi-cycle with an rms value exceeding this value will be understood as over voltage.
- **Overvoltage hysteresis:** Overvoltage hysteresis is where the start-up voltage is different from the end voltage of overvoltage. An overvoltage will start when the voltage threshold value is exceeded and will finish when it is lower than the value defined by the difference between the threshold and the hysteresis.
- **Gap threshold:** Serves to program the gap detection. Each semi-cycle with an rms value not reaching this defined value will be understood as a gap.
- **Gap Hysteresis:** Will define a gap hysteresis so that the initial voltage is different to the end of gap voltage. A gap will start when the voltage does not exceed the threshold value and will finish when this is lower than the value defined by the sum of the threshold and the hysteresis.
- **Interruption threshold:** defined as power off (absence of tension, interruption) the voltage drop below the value set.

- **Interruption hysteresis:** An interruption hysteresis is when the start-up voltage is different from the voltage interruption end. An interruption will begin when the voltage does not exceed the threshold value and ends when it exceeds the value defined by the sum of the threshold and hysteresis interruption.

Enables us to specify the energy capture time expressed in minutes.

1.56.1.2 Download configuration

Automatic downloads can be configured on this screen.

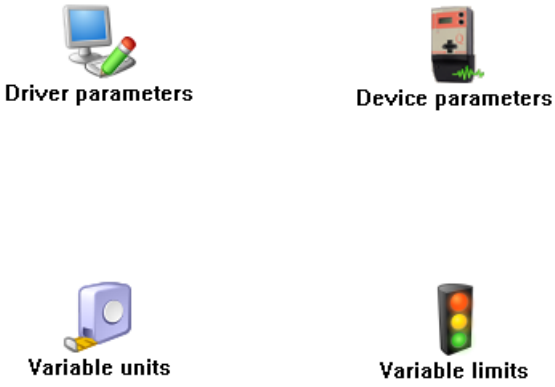


- **Type of download:** Selects the download period. The period can be selected as: Monthly, Weekly, Daily or for specific Hour periods.
- **Connection interval:** Allows you to select the start and end times of the download.

1.57.- QNA-PT

1.57.1 Driver options

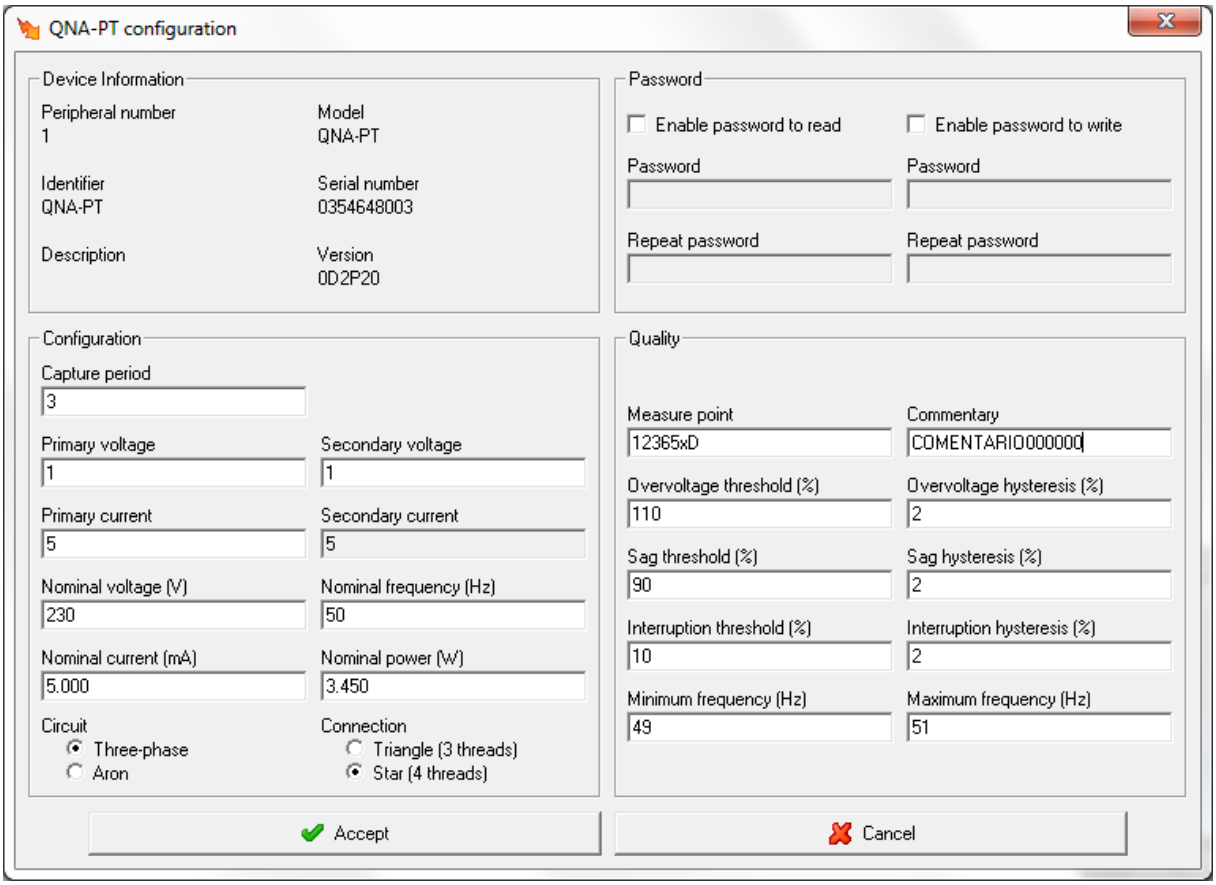
Options menu:

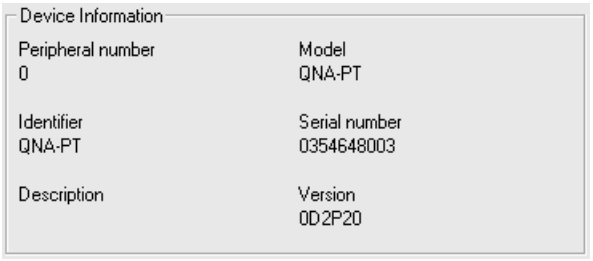


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

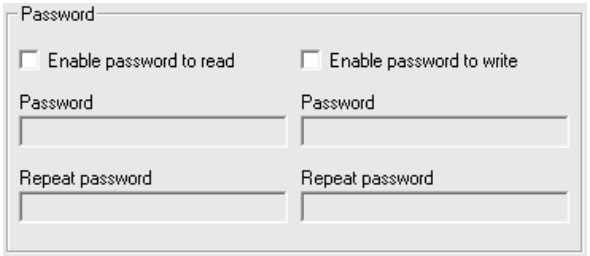
1.57.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

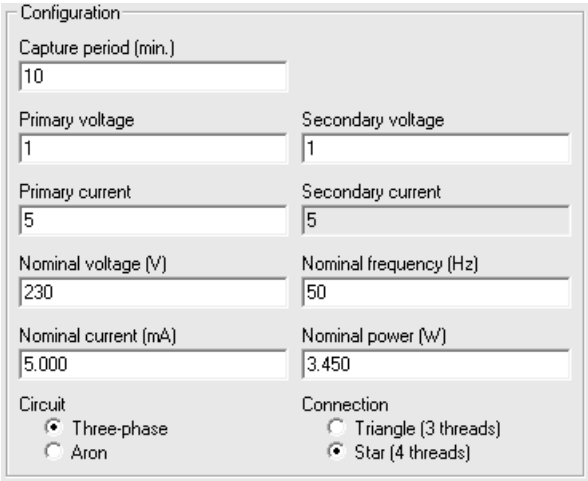




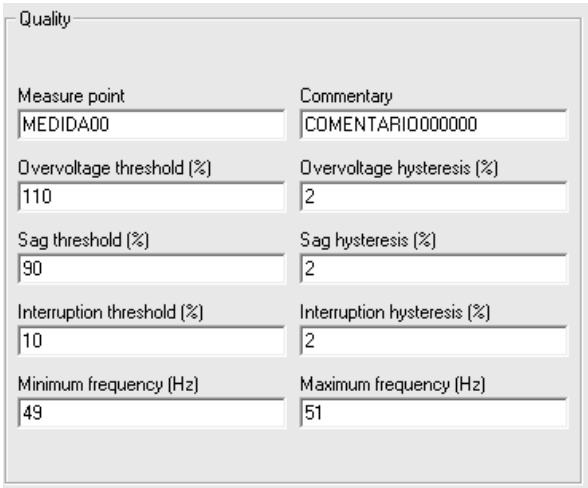
Shows information on the device.



Allows the password to be enabled or disabled to block both the reading and writing values and the configuration of the device.



- **Capture period:** Configuration in minutes between records stored on the device.
- **Primary voltage:** Device primary voltage value.
- **Secondary voltage:** Device secondary voltage value.
- **Primary current:** Device primary current value.
- **Secondary current:** Device secondary current value.
- **Rated voltage:** Rated voltage of the equipment, with a 3-wire configuration the composite voltage should be programd and the single voltage on four wires. If the measurement is carried out through voltage transformers, the programd value must refer to the secondary.
- **Nominal frequency:** Nominal frequency of the device.
- **Nominal current:** Nominal value of the device.
- **Nominal power:** Nominal power value of the device.
- **Circuit:** Enables the type of circuit to which it is connected to carry out the measurement to be chosen, whether it is connected to a three-phase device or if it only uses two current connectors for the measurement (Aron).
- **Connection:** Enables the type of connection to which it is connected to carry out the measurement to be chosen, whether delta (connection between phases, without neutral) or star (3-phase connection and neutral)



- **Measurement point:** Brief description of the measurement point where the QNA is situated
- **Comments:** Brief description of the measurement point.
- **Overvoltage threshold:** Serves to program the overvoltage percentage. Each semi-cycle with an rms value exceeding this value will be understood as over voltage.
- **Overvoltage hysteresis:** Overvoltage hysteresis is where the start-up voltage is different from the end voltage of overvoltage. An overvoltage will start when the voltage threshold value is

exceeded and will finish when it is lower than the value defined by the difference between the threshold and the hysteresis.

- **Gap threshold:** Serves to program the gap detection. Each semi-cycle with an rms value not reaching this defined value will be understood as a gap.
- **Gap Hysteresis:** Will define a gap hysteresis so that the initial voltage is different to the end of gap voltage. A gap will start when the voltage does not exceed the threshold value and will finish when this is lower than the value defined by the sum of the threshold and the hysteresis.
- **Interruption threshold:** defined as power off (absence of voltage, interruption) the voltage drops below the value set.
- **Interruption hysteresis:** An interruption hysteresis is when the start-up voltage is different from the voltage interruption end. An interruption will begin when the voltage does not exceed the threshold value and ends when it exceeds the value defined by the sum of the threshold and hysteresis interruption.
- **Minimum frequency:** Minimum frequency configured from a device generated event.
- **Maximum frequency:** Maximum frequency configured from a device generated event.

1.58.- RGU-10 / RGU-10 RA

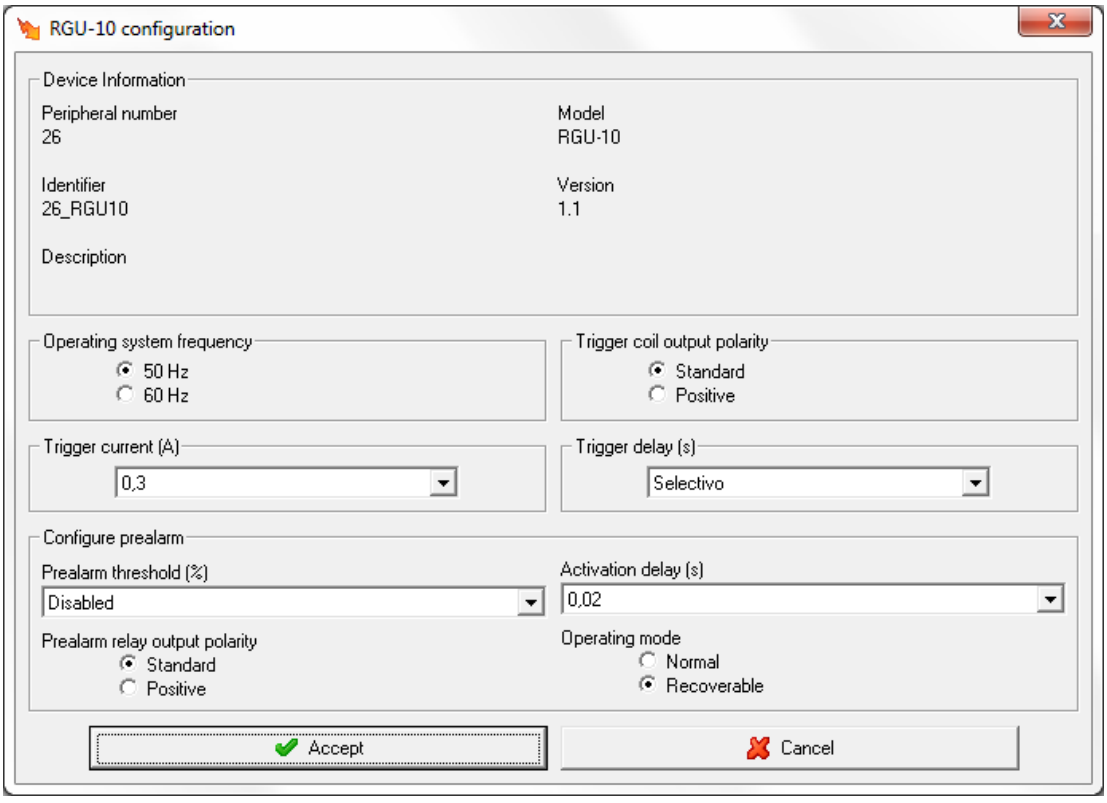
1.58.1 Driver options

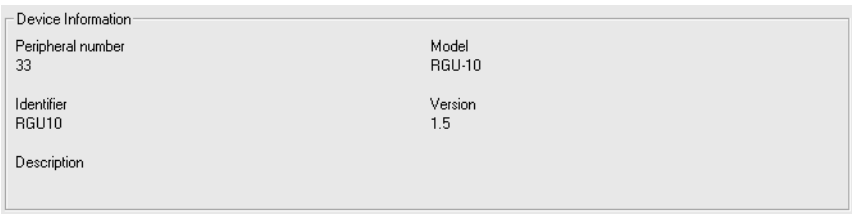
Options menu:

1.58.1.1 Device parameters

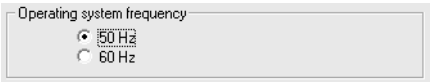
This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.

1.58.1.1.1RGU-10



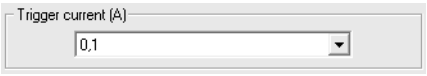


Shows general information.



Configuration of the frequency of the operating system.

Configuration of the polarity of the trigger coil relay output, allowing one of the two possible options to be selected (standard or positive).

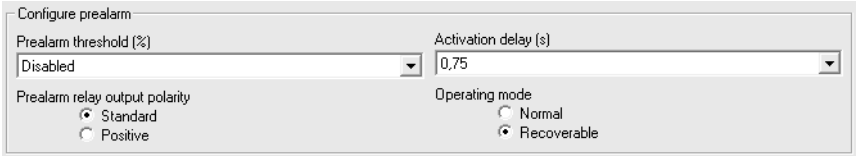


Configuration of the channel trigger threshold. It will be possible to select one of the following values:

0.03 A	0.1 A	0.3 A
0.5 A	1 A	3 A
5 A	10 A	30 A

Enables the trigger delay time from one of the following values to be selected:

Instantaneous	Selective	20 ms
100 ms	200 ms	300 ms
400 ms	500 ms	750 ms
1 s	3 s	5 s
10 s		



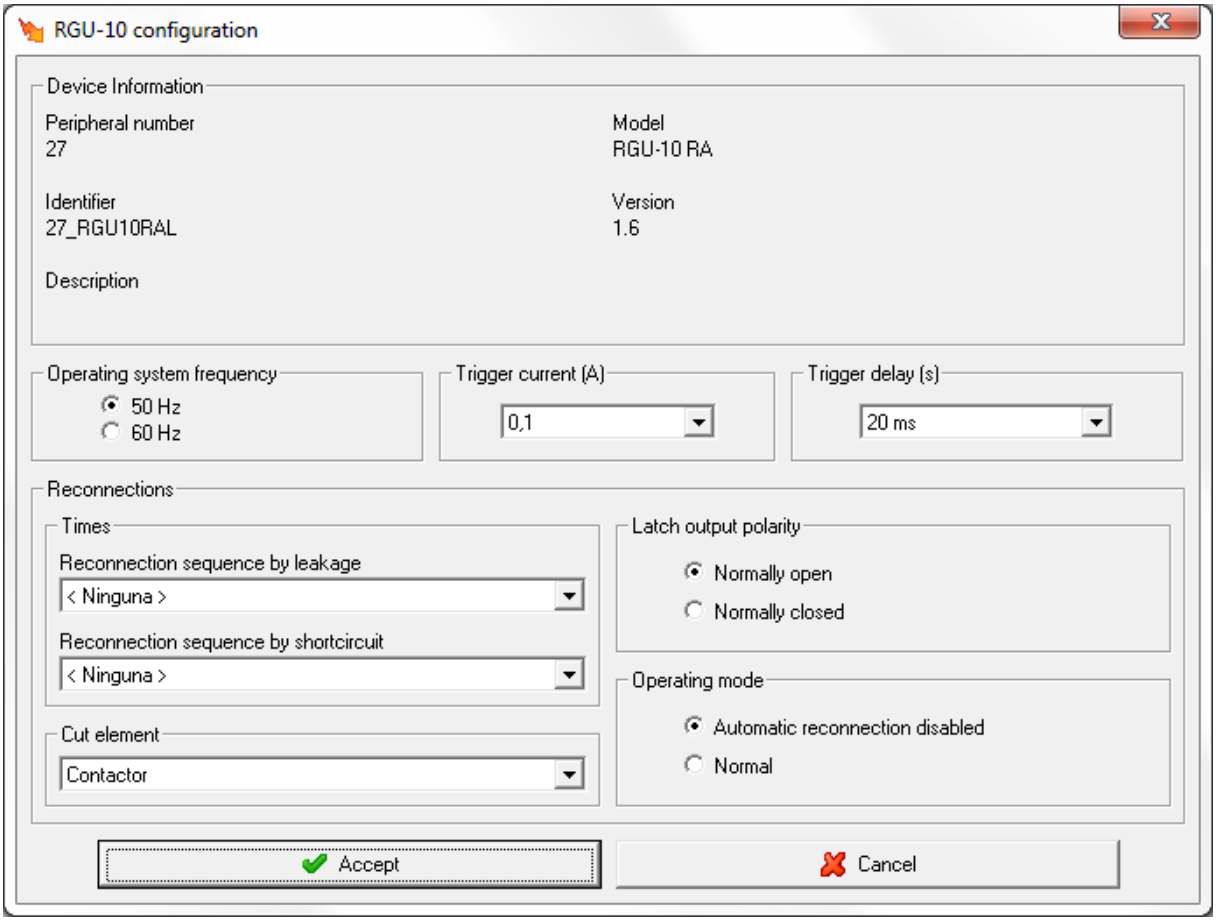
It will be possible to configure the pre-alarm following parameters:

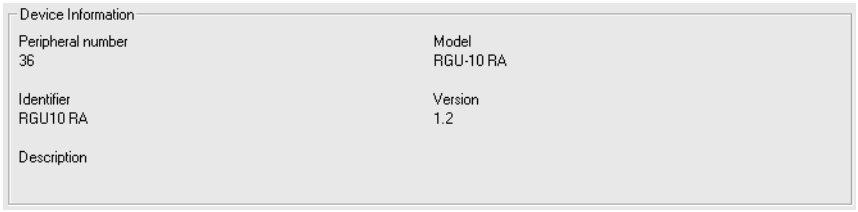
- *Pre-alarm threshold.* Where can % of the nominal current can be defined to activate the pre-alarm, this value will vary between 50 and 90%.
- *Delay time on activation.* Enable the time delay in activating the pre-alarm to be selected from among the following values:

0.02 s	0.10 s	0.20 s
0.30 s	0.40 s	0.50 s
0.75 s	1.00 s	3.00 s
5.00 s	10.00 s	

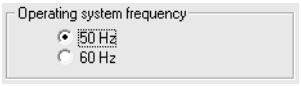
- *Polarity of the pre-alarm relay output.*
- *Pre-alarm operating mode.*

1.58.1.1.2RGU-10 RA

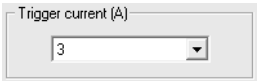




Shows general information.



Configuration of the frequency of the operating system.

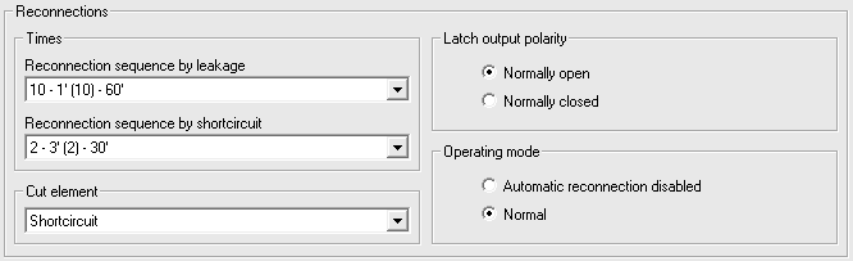


Configuration of the channel trigger threshold. It will be possible to select one of the following values:

0.03 A	0.1 A	0.3 A
0.5 A	1 A	3 A
5 A	10 A	30 A

Enables the trigger delay time to be selected from one of the following values:

Instantaneous:	Selective	20 ms
100 ms	200 ms	300 ms
400 ms	500 ms	750 ms
1 s	3 s	5 s
10 s		



It will be possible to set the following reconnection parameters:

- *Residual current device reconnection Sequence.* Enables one of the following values to be selected

No.reconnection	Sequence times	Reset time
6	8, 16, 30, 59, 115 and 224 seconds	15 minutes
30	20, 40 seconds and 5 minutes for the rest	15 minutes
8	30 seconds, 1, 2, 3, 4, 5, 6 and 7 minutes	15 minutes
6	10,20,30,60,130 and 600 seconds	5 minutes
6	2, 4 and 8 minutes for the rest	15 minutes
6	30 seconds, 1, 2, 3, 4, 8 and 16 minutes	15 minutes
10	1 minute interconnections	30 minutes
10	90 seconds interconnections	30 minutes
6	2, 4, 6, 6, 6 and 6 minutes	15 minutes
10	3 minutes interconnections	30 minutes
10	1 minute interconnections	60 minutes
10	90 seconds interconnections	60 minutes
6	8 seconds interconnections	15 minutes

The information shown will be xx – yy – zz, where xx corresponds to the number reconnection, yy to the sequence of time and zz to the reset time.

- *Circuit breaker reconnection. Allows one of the following values to be selected.*

No.reconnection	Sequence times	Reset time
Reclosure disabled		
2	1 minute interconnections	30 minutes
2	1 minute interconnections	60 minutes
2	90 seconds interconnections	30 minutes
2	90 seconds interconnections	60 minutes
2	3 minutes interconnections	30 minutes
2	30 seconds interconnections	30 minutes
6	30 seconds interconnections	30 minutes

The information shown will be xx – yy – zz where xx corresponds to the number reconnection, yy to the sequence of time and zz to the reset time.

- *Cut-off element.* Lets the type of cut off element be selected from one of the following values:

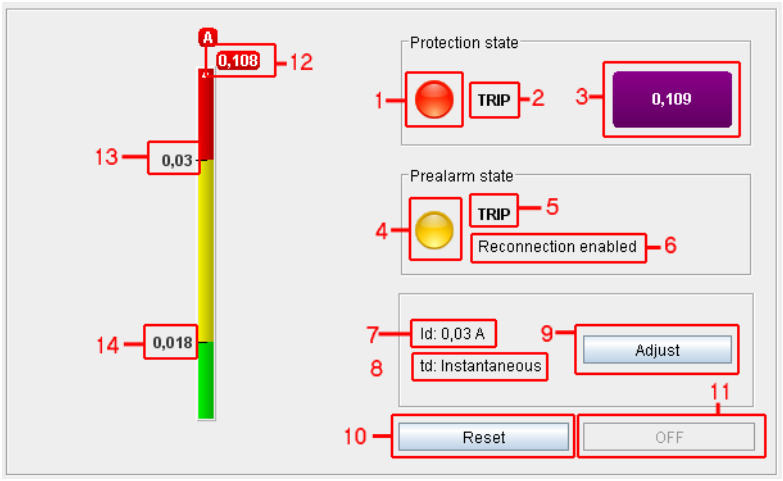
Switch
Circuit breaker
Circuit breaker + trigger coil

- *Polarity of the locking relay output.*
- *Operation mode.*

1.58.2 Displaying values

1.58.2.1.1RGU-10

The RGU-10 device will show the following screen values:

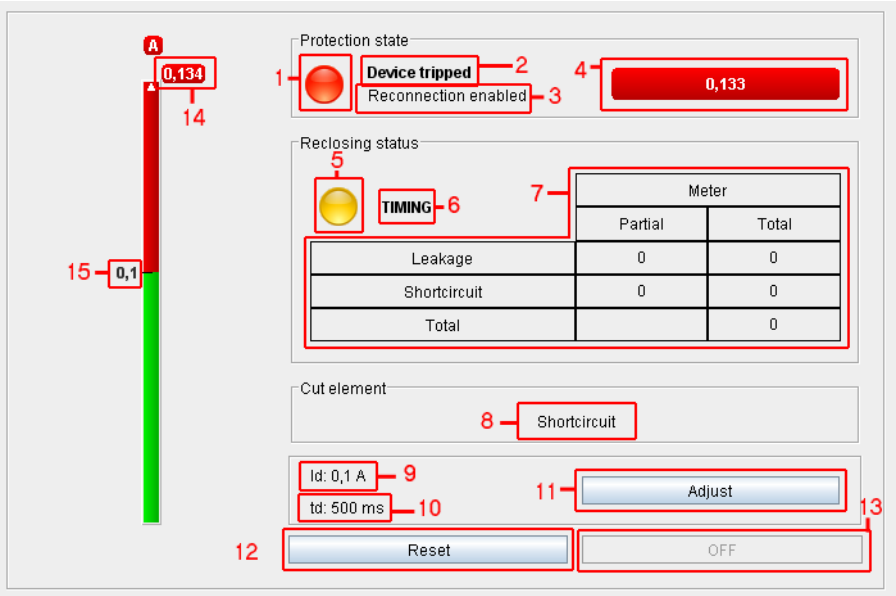


Where:

1. Protection status:
   - ♦ Not tripped
   - ♦ Tripped.
2. Additional information on the protection status.
3. Differential current value detected in the channel trigger. This information will only be visible when the channel is tripped.
4. Pre-alarm status:
   - ♦ Disabled
   - ♦ Pre-alarm enabled
5. Additional information on the status of the pre-alarm.
6. Additional information on the pre-alarm reconnection. This will only appear when automatic reconnection of the pre-alarm is enabled.
7. Information about the configured trigger current threshold
8. Information about the configured trigger time.
9. Adjustment button. Displays channel information and allows some parameters to be modified.
10. Reset button. If the channel is not triggered, the button will remain disabled. Push the button to restart the channel.
11. OFF button. Enables remote triggering of the channel to be made. If the channel is tripped the button will remain disabled.
12. Instantaneous differential current value. If the value exceeds the limits of the values bar, both over or under, an arrow below the value will indicate this.
13. Trigger threshold value configured for the channel
14. Pre-alarm value configured for the channel.

1.58.2.1.2 RGU-10 RA

The RGU-10 RA device will show the following value screen:



Where:

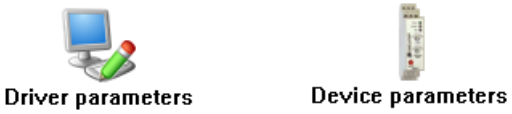
1. Protection status:
   - ♦ Not tripped
   - ♦ Tripped.
2. Additional information on the protection status.
3. Information that appears only when the reconnection is enabled
4. Differential current value detected in the channel trigger. This information will be visible only when the channel is tripped.
5. Reconnection status or channel locking indicator
   - ♦ Normal
   - ♦ ←→ . Blinking. The device is timing the reconnection
   - ♦ . Fixed. The channel is locked.
6. Additional information on the interlocking status.
7. Table with the partial and total counter values.
8. Cut-off Element configured.
9. Information about the configured trigger current threshold
10. Information about the configured trigger time.
11. Adjustment button. Displays channel information and allows some parameters to be modified.
12. Reset button. If the channel is not triggered, the button will remain disabled. Push the button to restart the channel.
13. Off button. Enables remote triggering of the channel to be made. If the channel is tripped the button will remain disabled.
14. Instantaneous differential current value. If the value exceeds the limits of the values bar, both over or under, an arrow below the value will indicate this).
15. Trigger threshold value configured for the channel

1.59.- RRM-C

This device does not keep a log, so it will not be possible to make graphs or tables of any parameter shown by the device.

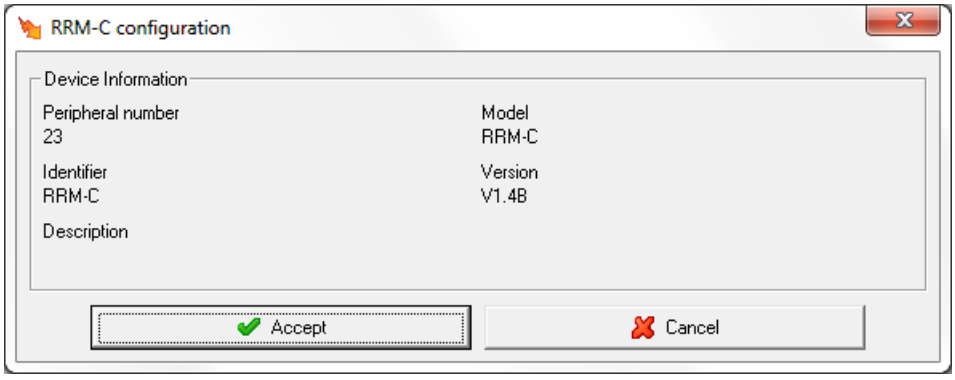
1.59.1 Driver options

Options menu:



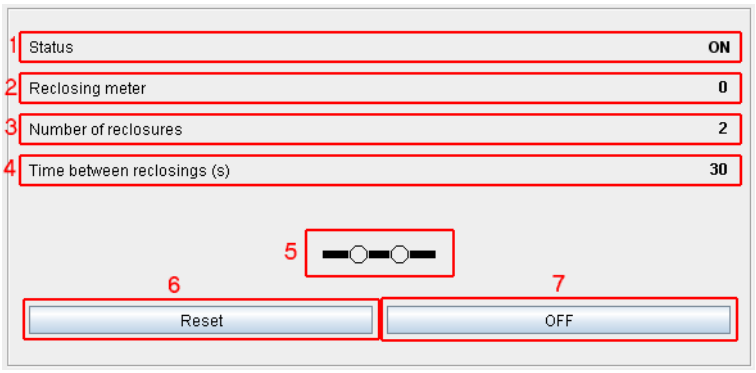
1.59.1.1 Device parameters

Click on the "Options" buttons and information such as the model and the version of the device will be shown.



1.59.2 Displaying values

The RRM-C device will show the following value screen:



Where:

1. Displays the status of the device.
2. Shows the number of actual reconnections.
3. Number of reconnections configured on the device.
4. Time between reconnections configured on the device.
5. State of the device relay.

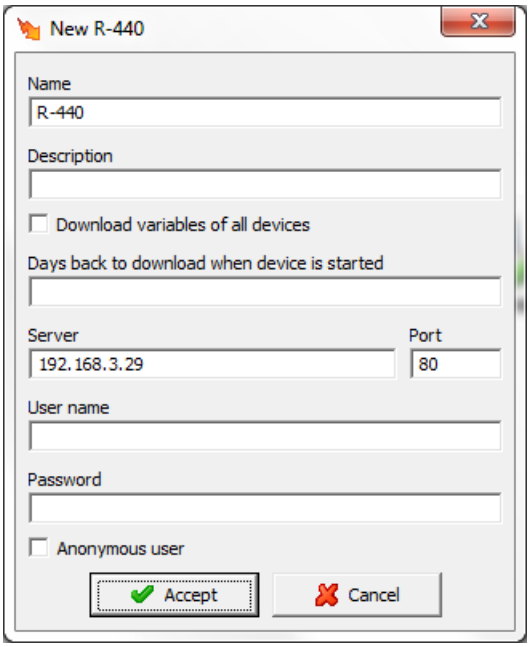
6. *Reset* button. Clicking the button resets the device.
7. *OFF* button. Clicking the button triggers the device.

1.60.- R-440

The driver of the R-440 is peculiar in that it can access the variable of the machines connected to it, as well as its own flow variables, counters, digital inputs and outputs.

1.60.1 Configuration of an R-440 device

Use the devices menu to add a new R-440 device as a first level device.



As shown in the previous dialogue, the address and port of the R-440 equipment to which we want to connect must be indicated, and also the user and password if authentication is enabled.

The 'Download variables from all the machines' option may be chosen, in which case all machines and variables accessible in R-440 device will automatically be downloaded. If this option is not set, each variable must be added manually.

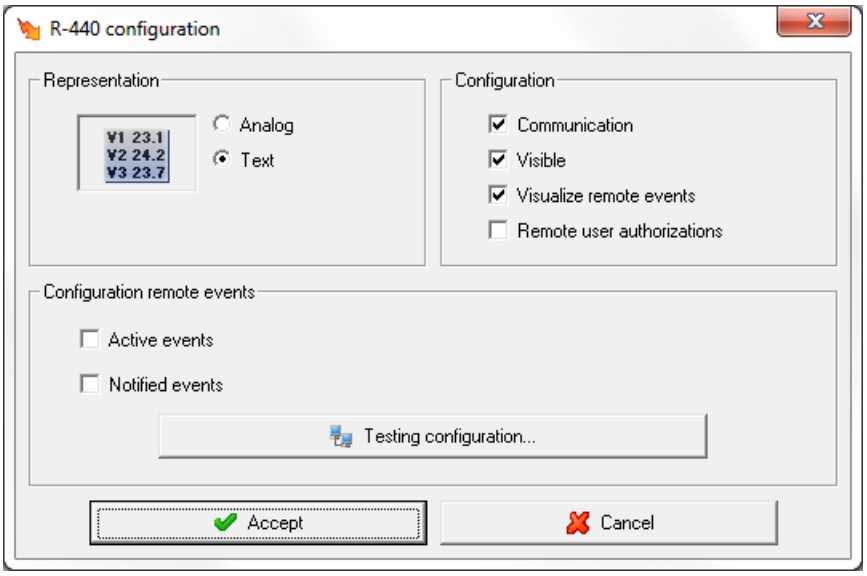
The 'Download dates previous to the current date when the device is started' option will show the number of days before the current date for which the files will be downloaded since the communications are established with the unit for the first time.

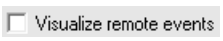
1.60.2 Driver options

Options menu:

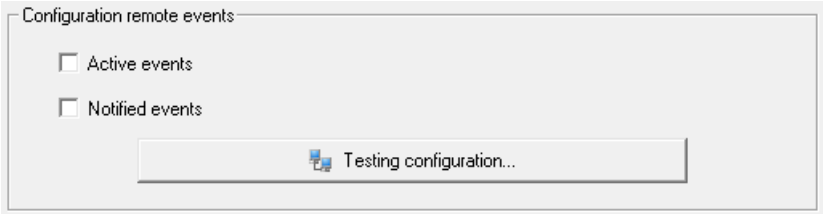
The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

1.60.2.1 Driver parameters





Allows the display of remote events in the client to be activated.

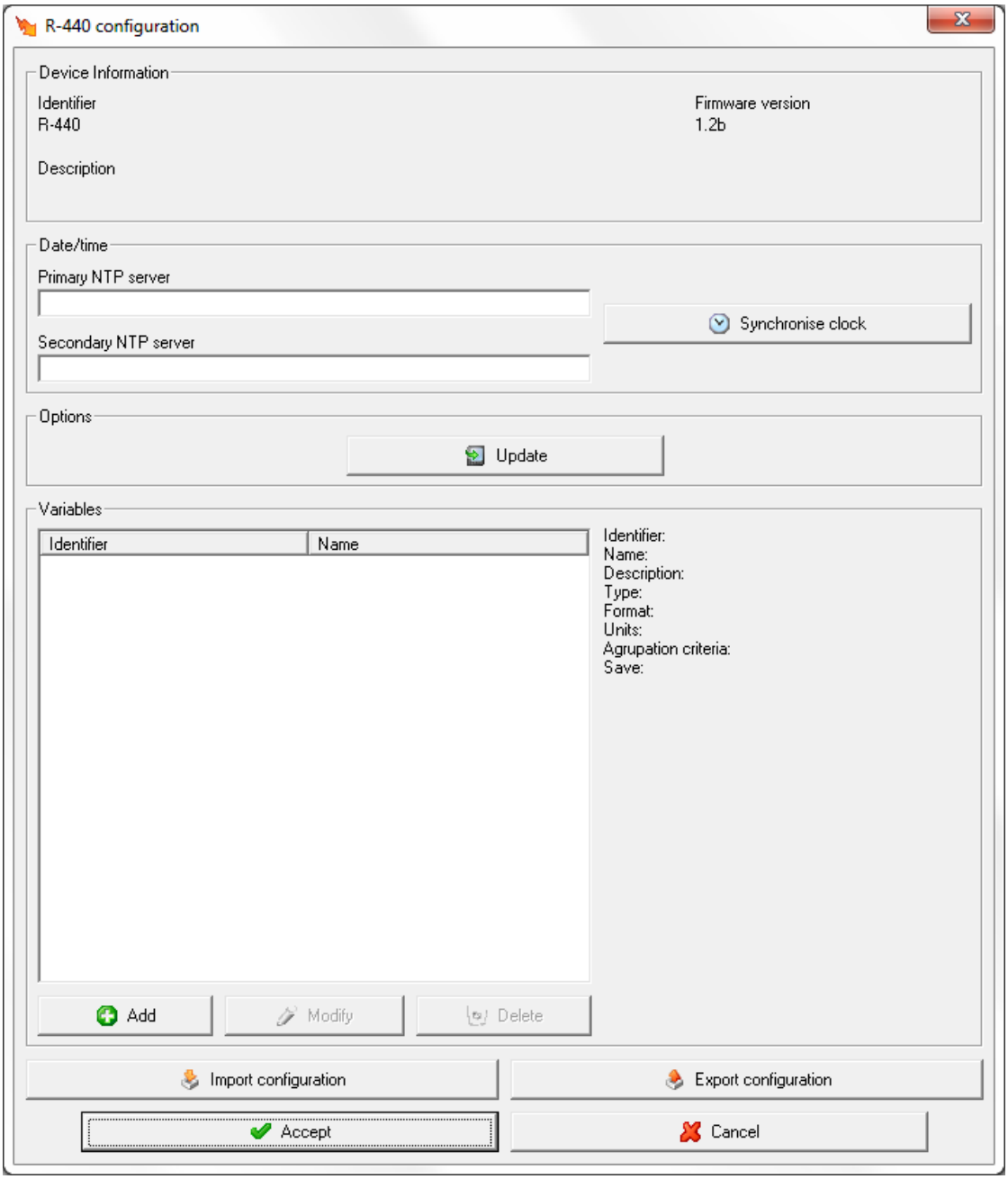


On activating the display of remote events the configuration of remote events will be enabled; here you can activate the types of events you want to receive and you can test communication with the remote equipment. These events can be displayed on the client in the same way as local events.

The remaining screen parameters are detailed in section 1.1.1 Driver parameters.

1.60.2.2 Device parameters

This screen is used to configure the variables that must be requested from the R-440 relating to the machines connected to it. In this case variable ‘Counter1’ of device ‘LM4’ has been selected.



General R-440 device information.

Possibility of sending the time and date from the PC to the R-440 device or configure an NTP server so that the device itself sets its time through the server.

The unit's firmware version can be manually updated by selecting the file with the '*upgrade*' extension.

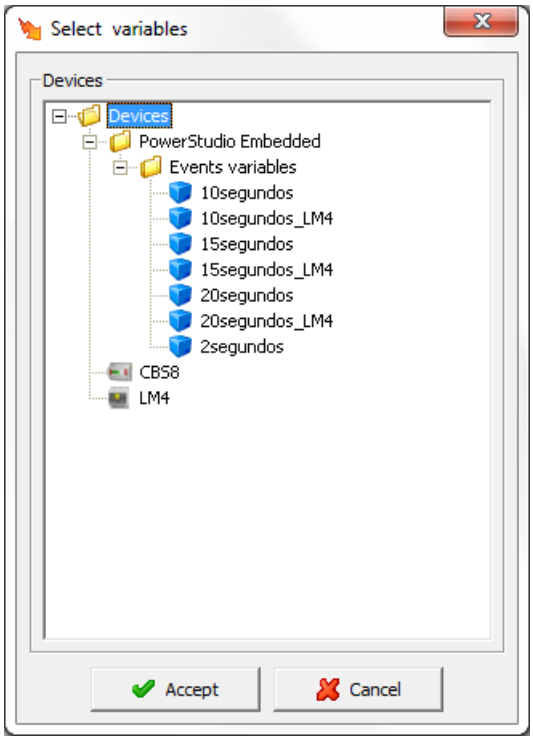
Configuration of the variables added to the R-440 device.

Allows loading of a variable configuration that was previously saved to disk. This option is useful when the same variables have to be configured on several R-440 devices.

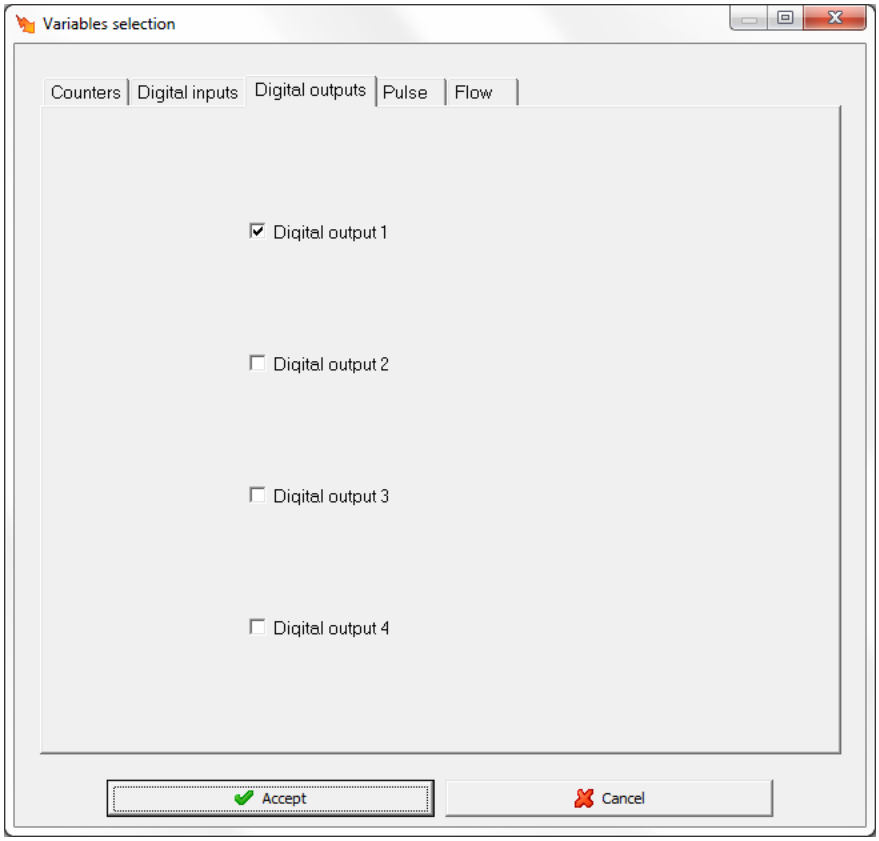
Allows the variable configuration to be saved to disk, so that it can subsequently be loaded on another R-440 device.

1.60.2.2.1 Variables

When the ‘Add’ button is pressed a selection tree of the R-440 devices will appear. When a device is selected, its variables selection screen will appear to select the variables to be added.



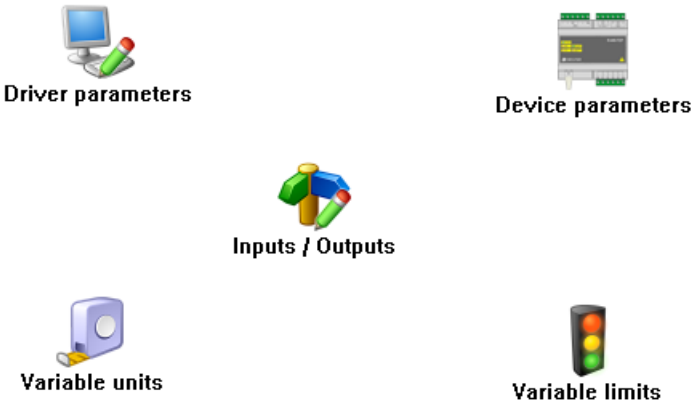
As an example of the variable selection screen we have that of an ‘LM4’ where we can see that the ‘Digital input 1’ variable has been selected.



1.61.- R-440 Embedded[9]

1.61.1 Driver options

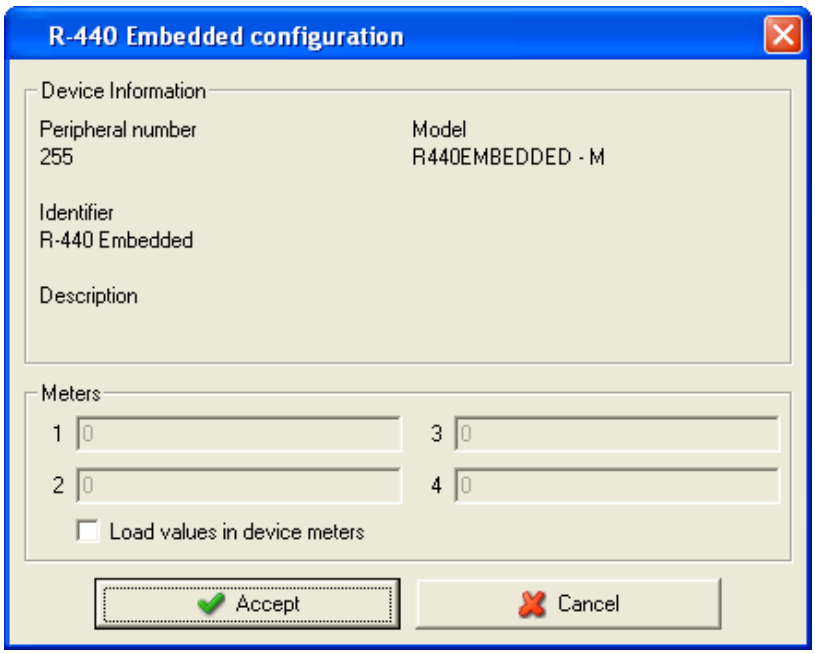
Options menu:



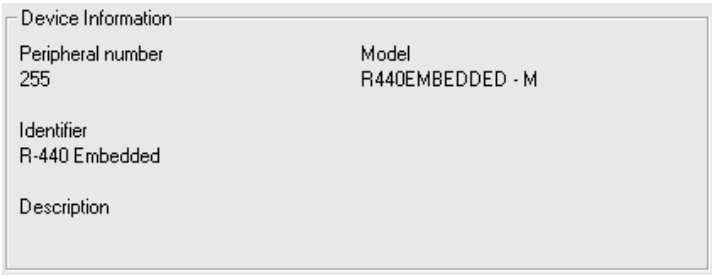
The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

1.61.1.1 Device parameters

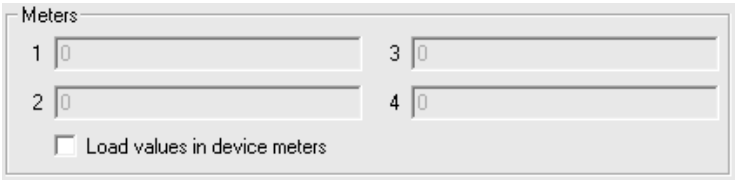
This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on '*Accept*' for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.



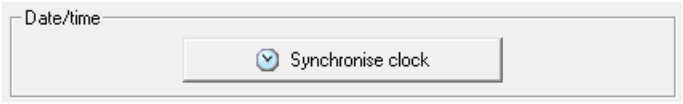
[9] Valid only in applications running inside R-440



General R-440 Embedded device information

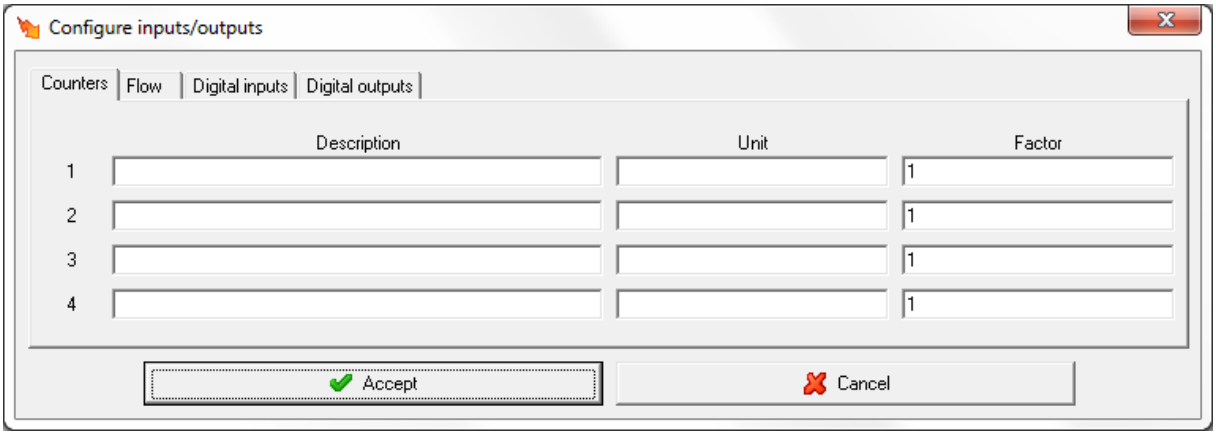


It is possible to load a value into device's counters.



Allows you to send the PC date and time to the R-440 Embedded device.

1.61.1.2 Inputs/Outputs



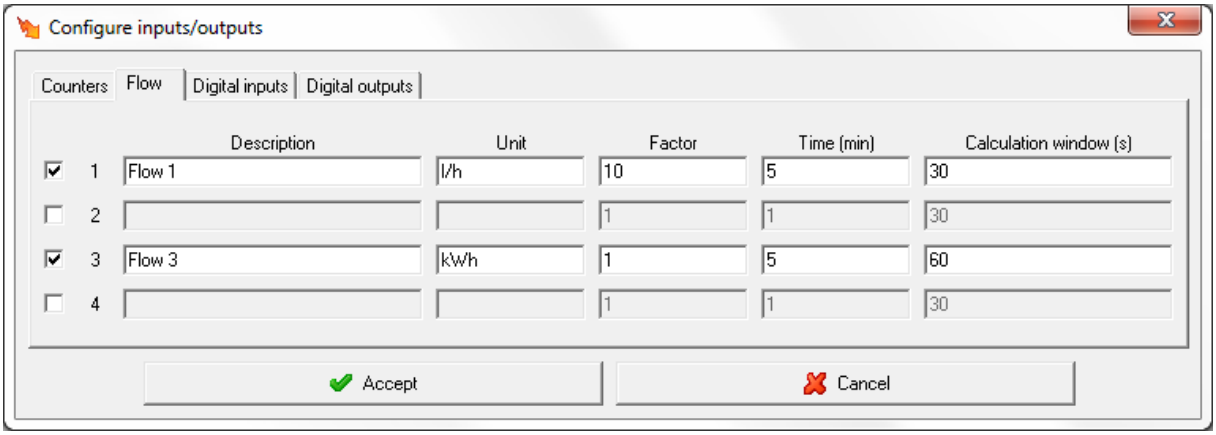
By means of

one can switch between the flow, digital inputs and outputs configurations of the counters. The previous image shows the configuration of the counters.

For each of the four counters it is possible to configure the following information:

- **Description:** Alphanumeric type data to identity the counter on the device display.
- **Unit:** Alphanumeric type datum to identify the counter units.
- **Factor:** Multiplier value which can be read on the counter.

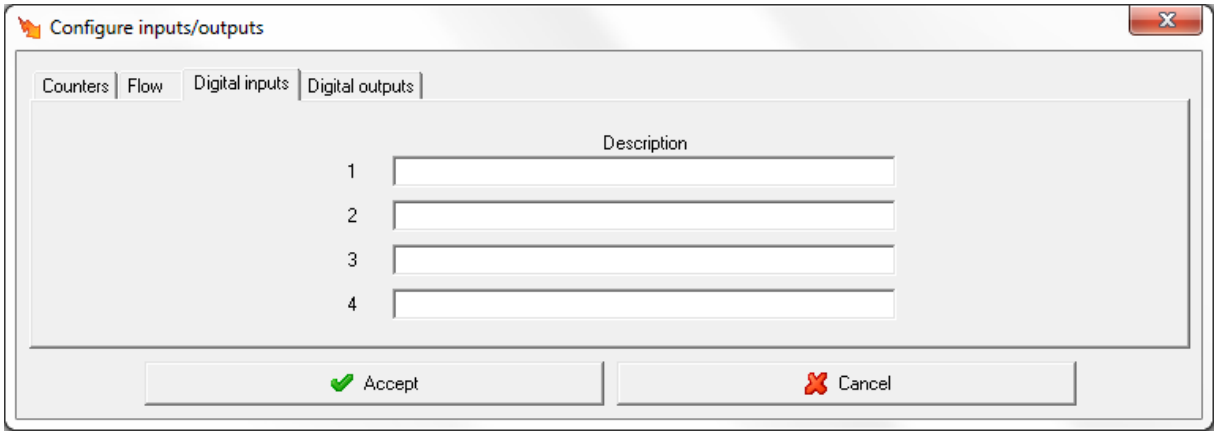
The configuration of the flows will look as follows:



Checking the selector ☑ will activate the flow variable. Remember if the selector is not checked it will not be possible to view the flow value of the related R-440 Embedded input.

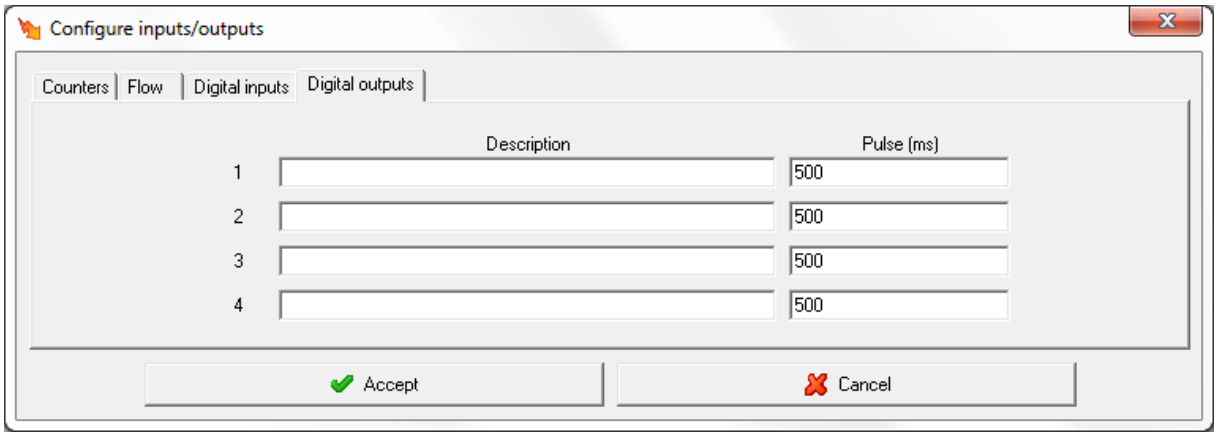
- **Description:** Alphanumeric type data which permits a brief description of the flow to be entered for better identification.
- **Unit:** Alphanumeric type data which permits a brief description of the units where the flow is shown to be entered.
- **Factor:** Multiplier value of each input pulse.
- **Time:** Time in minutes for calculating the flow value.
- **Calculation window:** Time window, in seconds, that the software will use to calculate an estimate of the flow, taking into account the value of the device counter.

The configuration of the digital inputs is as follows:



- **Description:** Alphanumeric type data which permits a brief description of the digital input to be entered for better identification.

Finally, the configuration of the digital outputs is as follows:

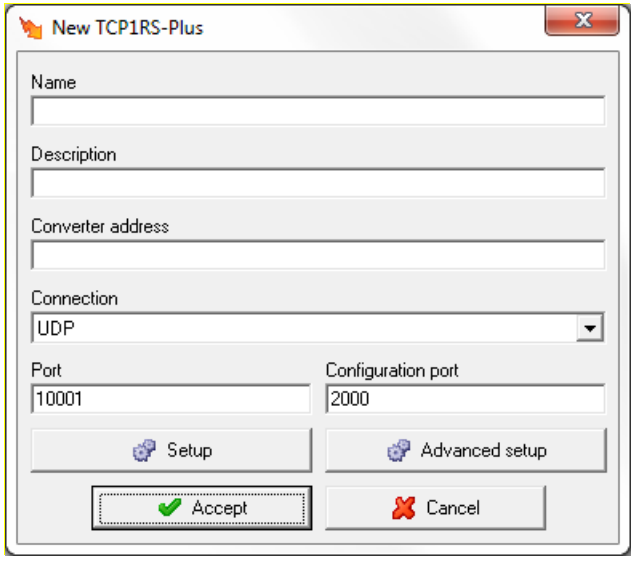


- **Description:** Alphanumeric type data which permits a brief description of the digital output to be entered for better identification.
- **Pulse:** Numeric data type which allows the opening of the digital output to be defined in milliseconds.

1.62.- TCP1RS+

The TCP1RS+ converter connects units that work with RS-485 serial communication to an Ethernet network using the IP protocol.

Check 'Manual Editor' when this device is added or modified; the following dialog box will be displayed:



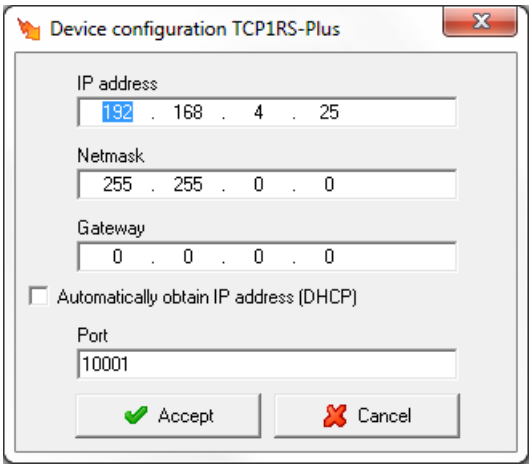
- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Enter a brief description of the device using alphanumeric data.
- **Converter address:** Corresponds to the address the program uses to communicate with the device. This parameter can be an IP address or a name. This address should not be confused with the MAC address.
- **Connection:** Indicates whether the connection is UDP, TCP or Modbus TCP.
- **Port:** Corresponds to the communications port.
- **Configuration port:** Corresponds to the communications port the program uses to configure the device. The default port is 2000.

Follow these steps so that the TCP1RS+ device can communicate through a router:

1 - In the *'Address converter'* field enter the router's IP address.
2 - In the *'Port"* field enter the communications port and redirect this port on the router to the device's communications port.
3 - Redirect the configuration port on the router to port 2000 of the converter.

NOTE: For information on readdressing ports consult the router user manual.

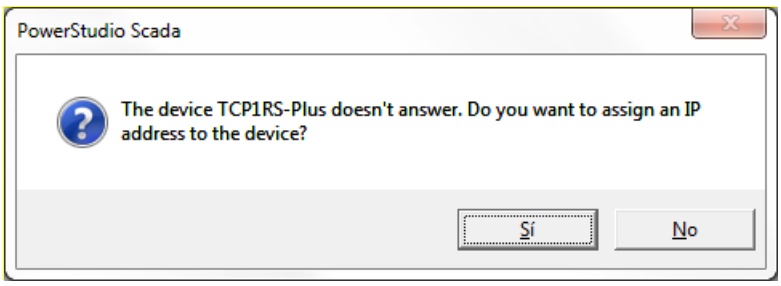
- **Parameters:** Clicking on this button will open a dialogue box, where a number of parameters of the device can be configured.



- *IP address:* Corresponds to the IP address used to communicate with the device.
- *Subnet mask:* Corresponds to the subnet mask used on the network where the device is connected
- *Predetermined Gateway:* Corresponds to the address of the gateway if the device is not on the same network as the PC containing the program.
- *Obtain an IP address automatically (DHCP):* This option will be enabled when we want the device to automatically receive the IP address via a DHCP server.
- *Port:* Corresponds to the device communications port.

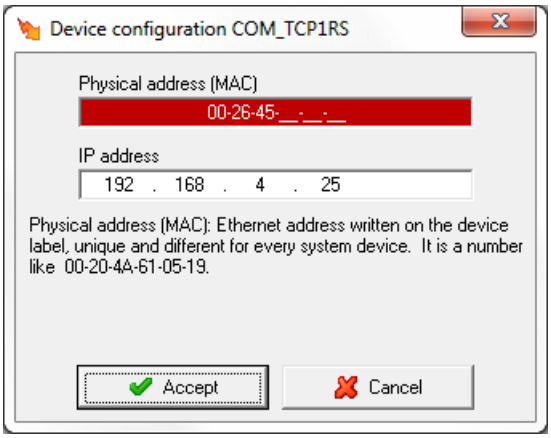
- **Advanced configuration:** Allows you to configure of a series of additional parameters on the device. Refer to 'Editor manual'.

On adding or modifying the device, the software will try to detect it. If it is unable to detect it, the device is new and no IP has been assigned or a different IP to that entered in the *'Converter Address'* has been assigned, it will ask if you wish to assign a new IP address to the converter.



An IP address can only be assigned to the device if it is on the same network as the computer running the program.

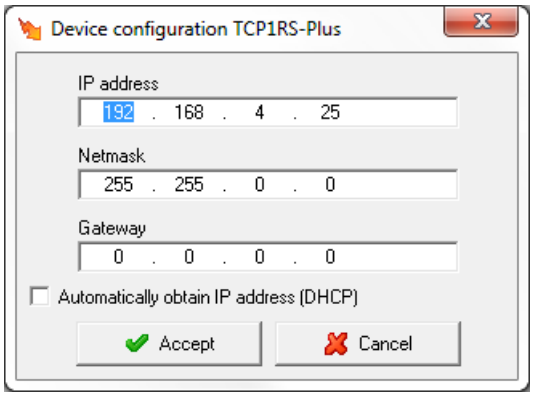
If the answer is *'Yes'*, the following dialogue box will appear, which will permit an IP address to be assigned to the device.


Device configuration COM_TCP1RS
Physical address (MAC)
00-26-45-__-__-__
IP address
192 . 168 . 4 . 25
Physical address (MAC): Ethernet address written on the device label, unique and different for every system device. It is a number like 00-20-4A-61-05-19.
Accept
Cancel

- **Physical address (MAC):** The unique Ethernet address for each network device, which is different for all network devices. The hardware address that any network interface has. It will be of the 00-26-45-61-05-19 type.

- **IP Address:** IP Address assigned to the device that has the physical address that was entered in the previous field.

If it is possible to assign an IP address to the converter, the following dialogue box will appear:

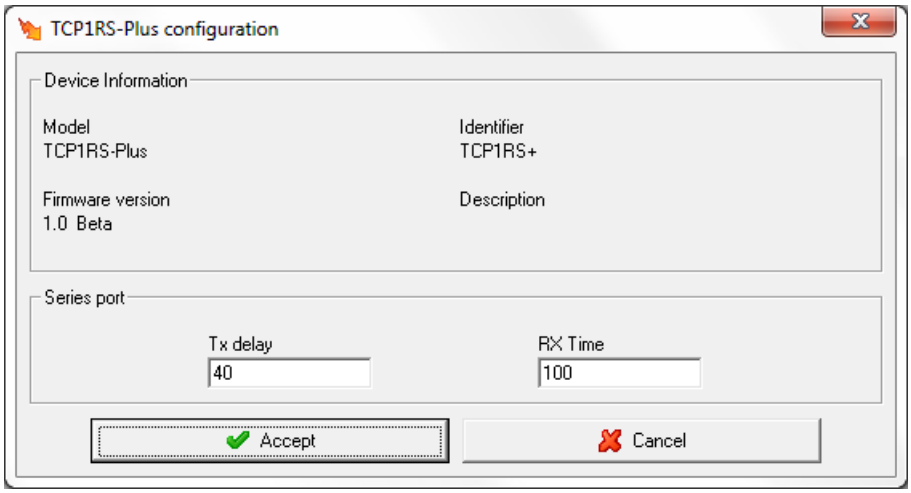


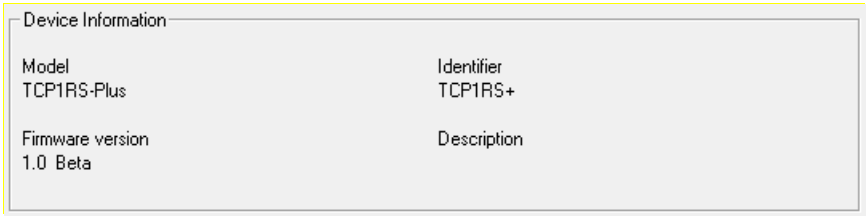
To complete the configuration of the rest of the parameters, as required to establish the communications with the device.

1.62.1 Driver options

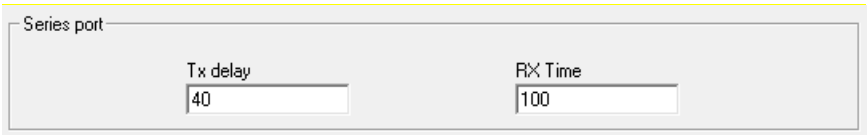
1.62.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. When the dialog box is opened, the software will read the device's configuration. When this procedure is complete, click on '*Accept*' and the software will send the information to the device if any changes have been applied. The information will never be stored on the hard drive of the PC.





Displays general information.



Allows you to configure the parameters of the device's RS485 communications port.

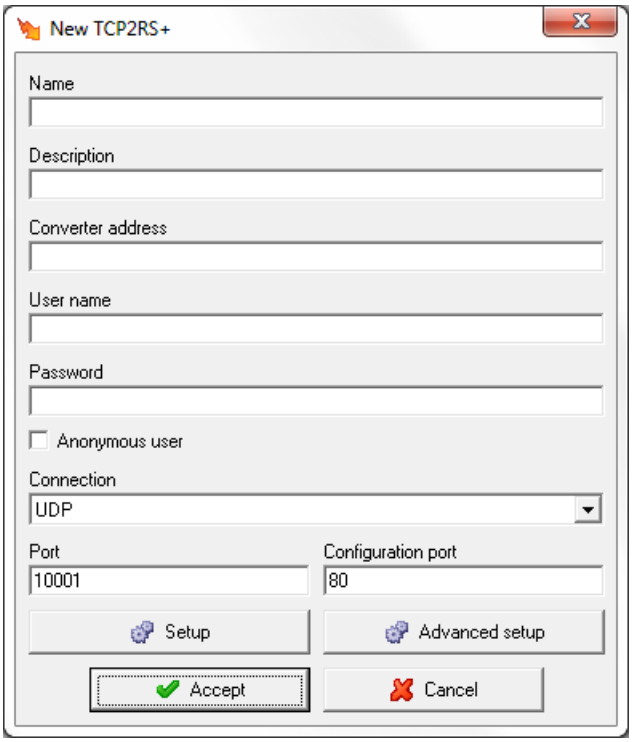
- **TX delay**: Value in milliseconds. Waiting time before a frame is transmitted.
- **RX time**: Value in milliseconds. This is the time during which the unit will wait for a response from devices connected to the port, also known as the “Timeout”.

1.63.- TCP2RS+

The TCP2RS+ converter connects equipment that works with a serial communication (RS-232/RS-485) to an Ethernet network using IP protocol.

1.63.1 Configuration of a TCP2RS+ device

When adding or modifying this device, see 'Editor Manual', the following dialogue box appears:



Where

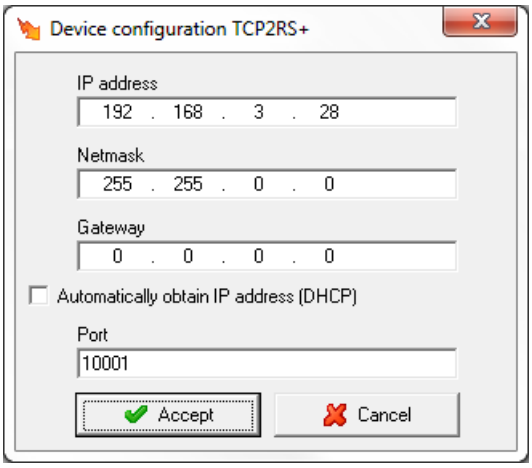
- **Name:** Alphanumeric field that uniquely identifies the device throughout the program. There are no two devices in the configuration with the same name.
- **Description:** Enter a brief description of the device using alphanumeric type data.
- **Converter address:** Corresponds to the address the program uses to communicate with the device. This parameter can be an IP address or a name. This address should not be confused with the MAC address.
- **User name:** The default user name is '*admin*'.
- **Password:** Allows you to enter the password configured in the converter.
- **Connection:** Indicates whether the connection is UDP, TCP or MODBUS-TCP.
- **Port:** Corresponds to the communications port.
- **Configuration port:** Corresponds to the communication port the program uses to configure the device. This port is 80 by default.

For a TCP2RS+ device to communicate via a router the following steps must be followed:

1 - In the *'Address converter'* field enter the router's IP address.
2 - In the *'Port"* field enter the communications port and redirect this port on the router to the device's communications port.
3 - Redirect the configuration port on the router to port 80 of the converter.

NOTE: For information on readdressing ports consult the router user manual.

- **Parameters:** By clicking the button a dialogue box will appear where a number of parameters of the device can be configured.

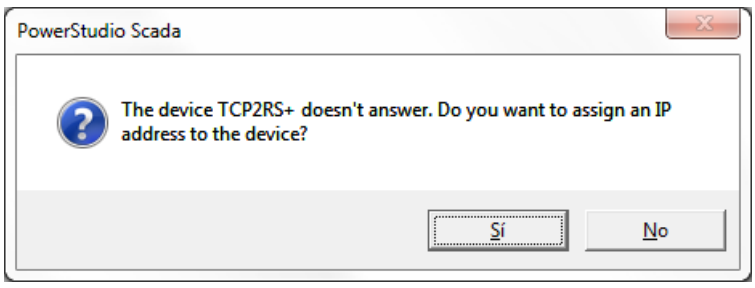


Where:

- *IP address:* Corresponds to the IP address used to communicate with the device.
- *Subnetwork mask:* Corresponds to the subnetwork mask used on the network where the device is connected
- *Predetermined Gateway:* Corresponds to the address of the gateway if the device is not on the same network as the PC containing the program.
- *Obtain an IP address automatically (DHCP):* This option will be enabled when we want the device to automatically receive the IP address via a DHCP server.
- *Port:* Corresponds to the device communications port.

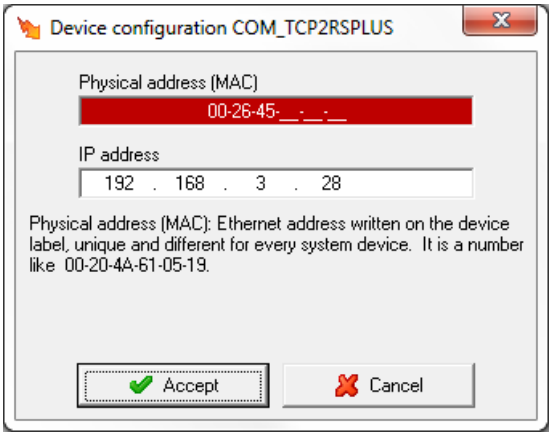
- **Advanced configuration:** Permits the configuration of a series of additional parameters on the device. Refer to 'Editor manual'.

On adding or modifying the device, the software will try to detect it. If it is unable to detect it, if the device is new or has not been allocated an IP address or has an allocated IP different to that entered in the *'Converter Address'*, it will ask if you want to assign a new IP address to the converter.



It will only be possible to assign an IP address to the device if it is on the same network as the computer running the program.

If the answer is *'Yes'*, the following dialogue box will appear, which will permit an IP address to be assigned to the device.

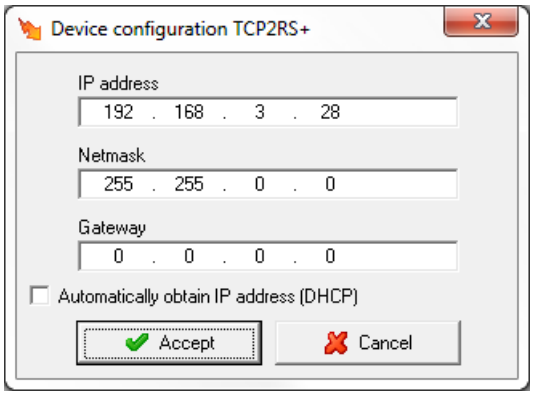

Device configuration COM_TCP2RSPLUS
Physical address (MAC)
00-26-45-__-__-__
IP address
192 . 168 . 3 . 28
Physical address (MAC): Ethernet address written on the device label, unique and different for every system device. It is a number like 00-20-4A-61-05-19.
Accept
Cancel

Where:

- **Physical address (MAC):** Ethernet address that each device has, which is unique and distinct on all network devices. The hardware address that any network interface has. Will be of the type 00-26-45-61-05-19.

- **IP address:** IP Address to be allocated to the device that has the physical address introduced in the previous field.

If it is possible to assign an IP address to the converter, the following dialogue box will appear:



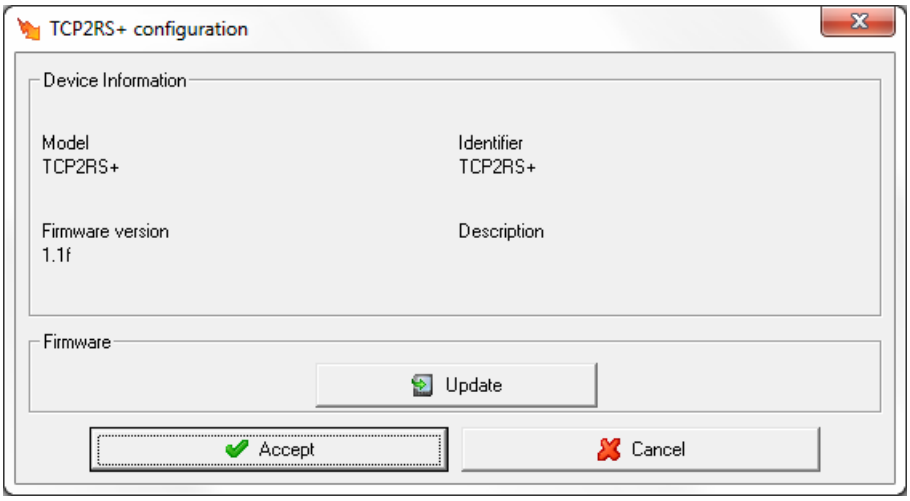
To finish setting up the rest of the parameters for communication with the device.

1.63.2 Driver options

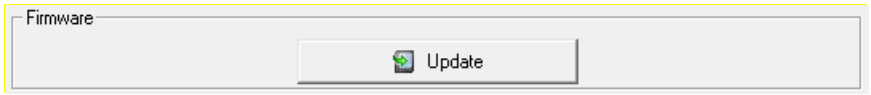
Options menu:

1.63.2.1 Device parameters

The information displayed on the device and manual update of the firmware can be configured on this screen.



Displays general information about the device.



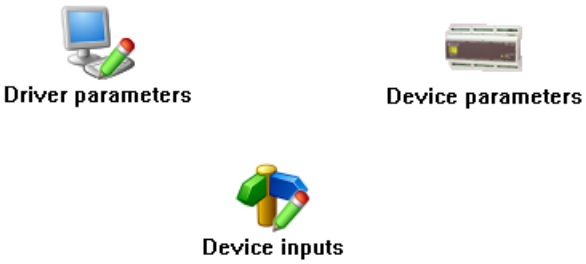
The unit's firmware version can be manually updated by selecting the file with the '*upgrade*' extension.

1.64.- TCP50–ALARM

This device does not keep a log; therefore it is not possible to configure any device parameters.

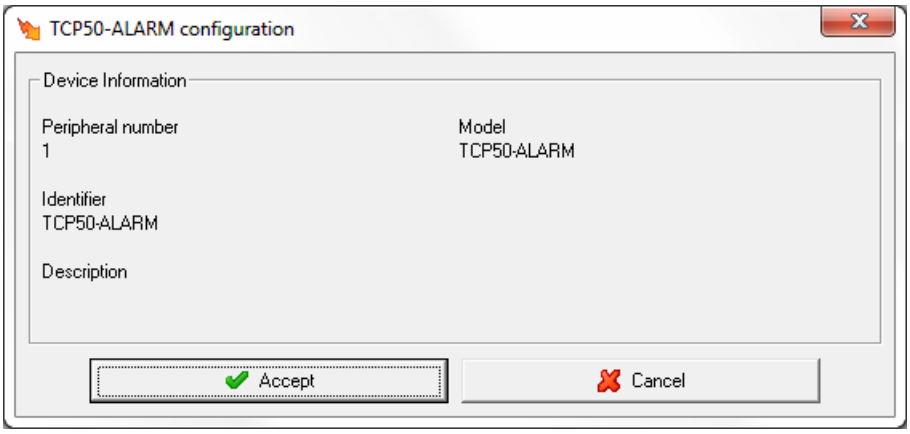
1.64.1 Driver options

Options menu:



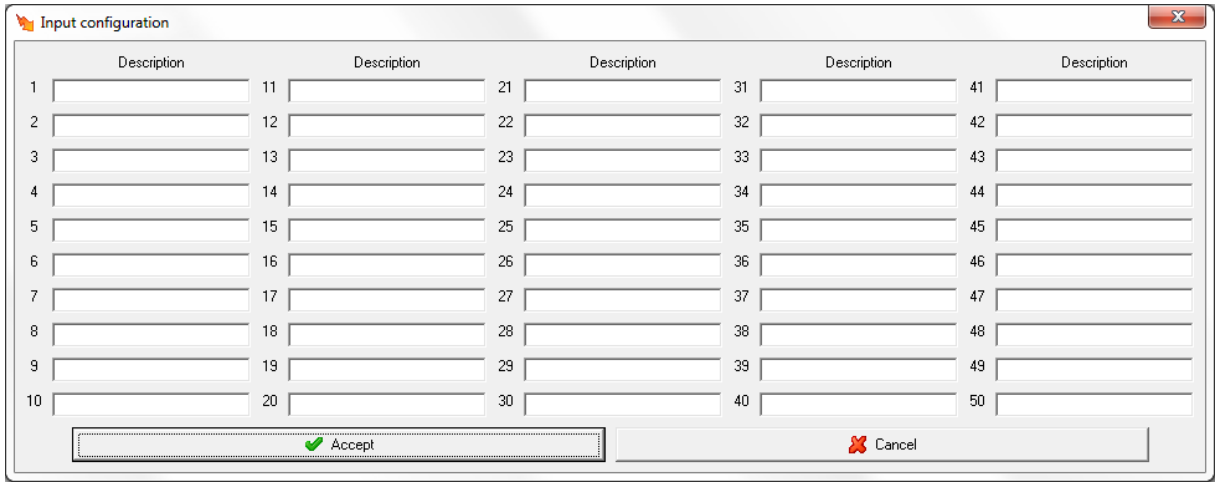
1.64.1.1 Device parameters

Click on the "Device Parameters" button and information will be shown about the device.

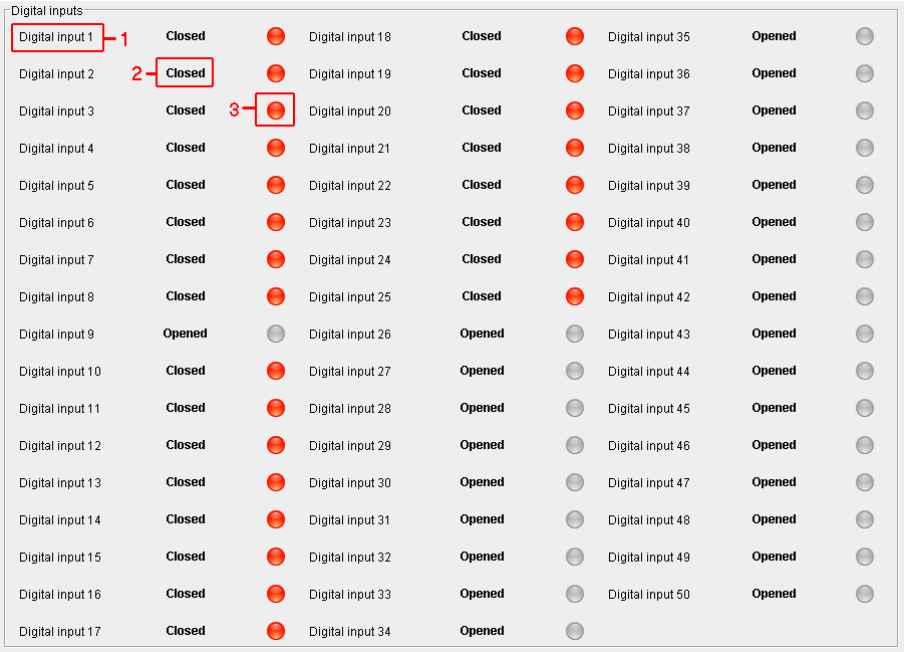


1.64.1.2 Device inputs

By means of this dialogue box a brief description of the device inputs can be entered for improved identification purposes.



1.64.2 Viewing values



1 Digital input number. Specifies the digital input in use.

2 Input status.

Input Open.
Input Closed.

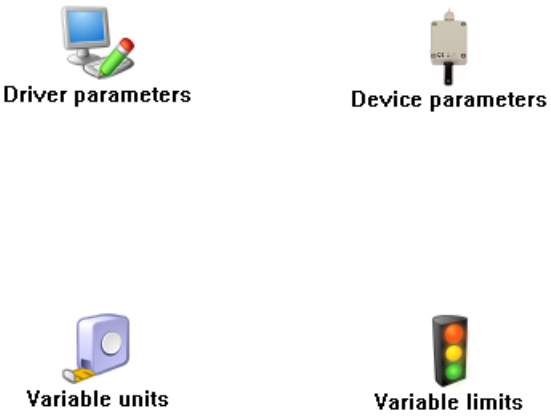
3 Input status.

Open.
Closed.

1.65.- TH-DG-RS485

1.65.1 Driver options

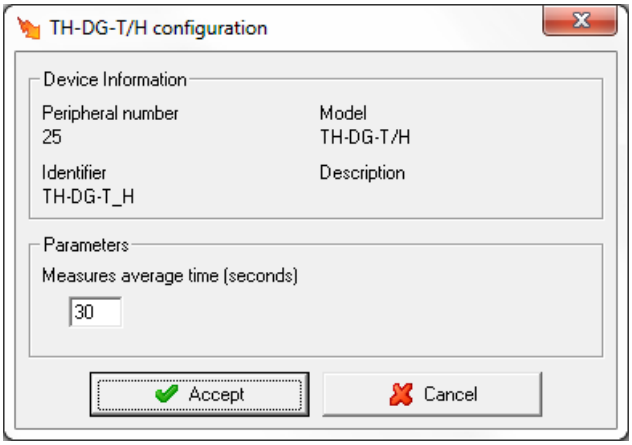
Options menu:

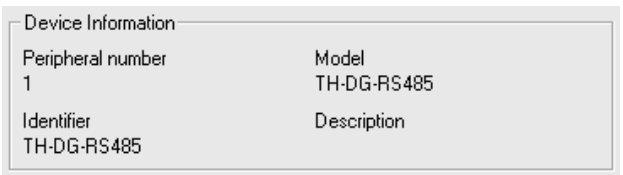


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

1.65.1.1 Device parameters

This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.





Displays general information.

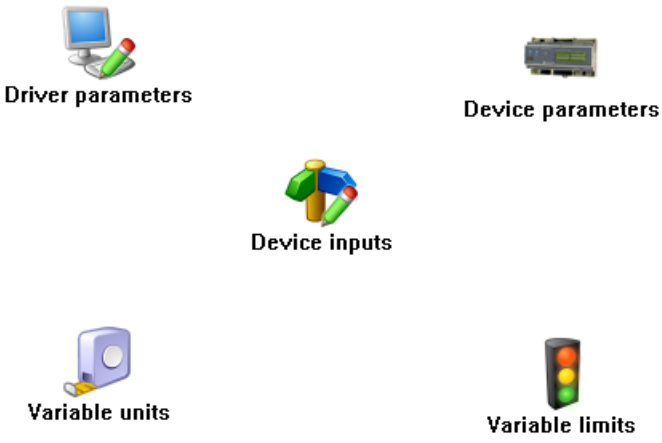
Allows the average measurement recording time to be entered. The TH-DG-RS485 device measures the temperature and humidity and calculates the average. Each time the period indicated in this screen has elapsed, it will record the value obtained.

1.66.- TR8

This device may be configured as master or slave, and up to 31 slave devices can be connected to a master device. At the time the slave devices are connected to the master, 30 seconds will be required to detect all the devices. If PowerStudio is started during this time, the values of the devices that have not yet been detected will not be monitored.

1.66.1 Driver options

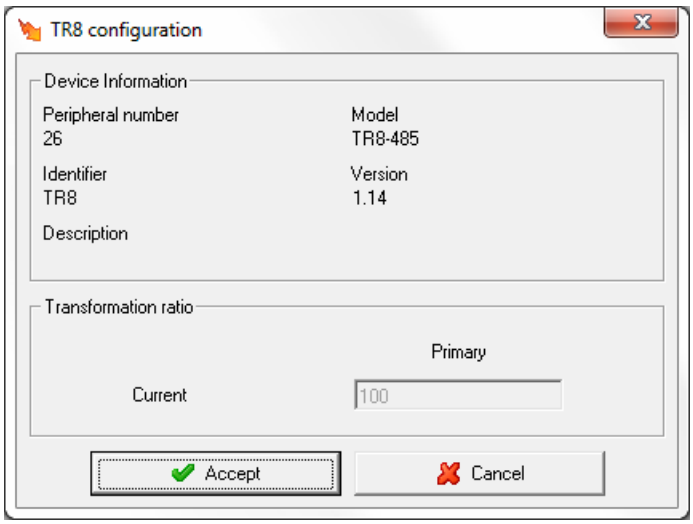
Options menu:

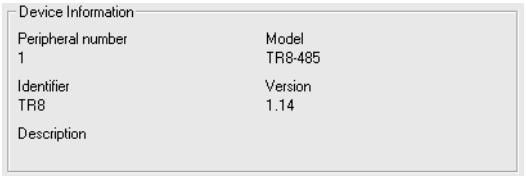


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

1.66.1.1 Device parameters

This screen allows some of the internal parameters of the device to be viewed, and it is not possible to change any of the configuration parameters. In no case will the information be stored on the hard drive of the PC.





Shows information on the device.

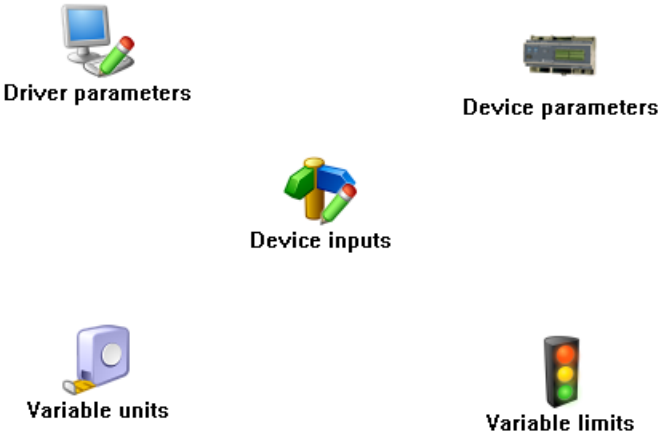
Shows current primary value on the device.

1.67.- TR16

This device may be configured as master or slave, and up to 31 slave devices can be connected to a master device. At the time the slave devices are connected to the master, 30 seconds will be required to detect all the devices. If PowerStudio is started during this time, the values of the devices that have not yet been detected will not be monitored.

1.67.1 Driver options

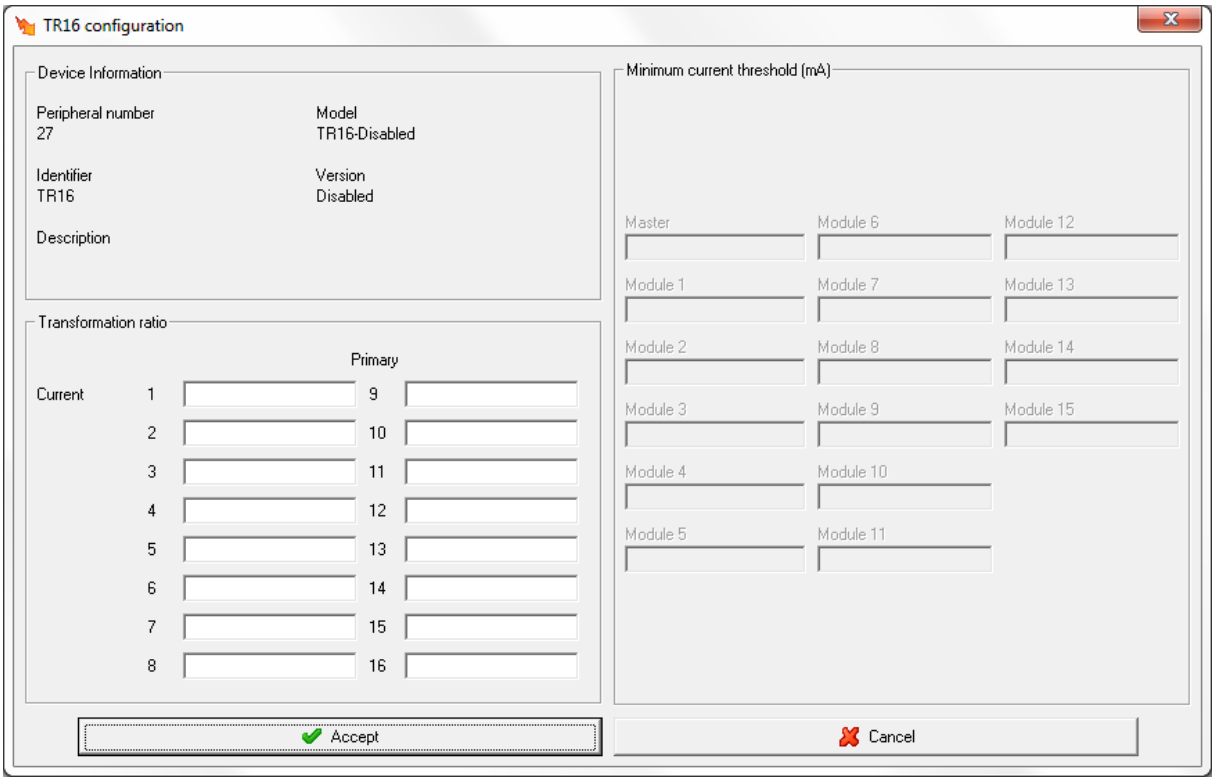
Options menu:

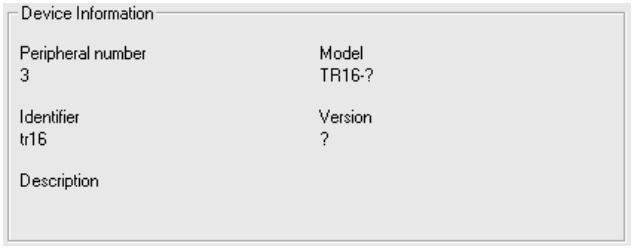


The *'Variable units'* and *'Variable limits'* options are explained in detail in sections 1.1.2 Variable units and 1.1.3 Variable limits, respectively.

1.67.1.1 Device parameters

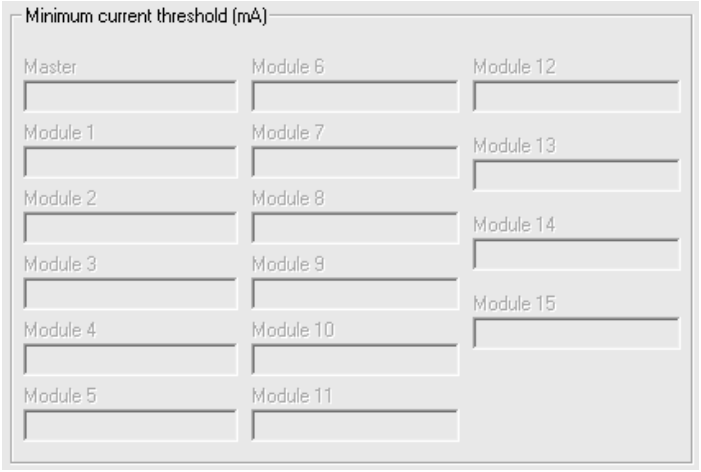
This screen allows some of the internal parameters of the device to be viewed, and it is not possible to change any of the configuration parameters. In no case will the information be stored on the hard drive of the PC.





Shows information on the device.

Allows you to define the primary current value for each one of the 16 inputs.

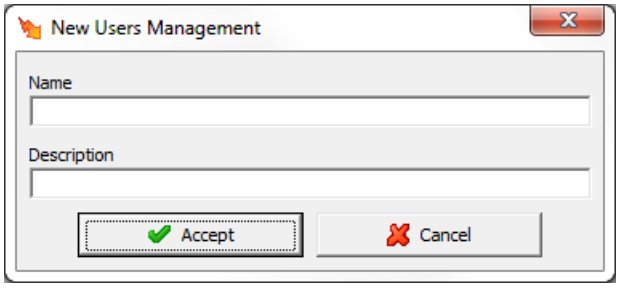


Enables definition of the current threshold (starting point on the scale) for the different modules.

1.68.- GUSERS / USER MANAGEMENT

The GUSERS driver enables you to create users to assign tags and permissions can be assigned for the different energy recharging points managed by the application.

The following dialogue box appears on adding the GUSERS driver:



The name will allow distinction between several GUSERS drivers that could be working simultaneously in the same application, since it will appear below each corresponding icon.

1.68.1 Driver options

Options menu:

1.68.1.1 Driver parameters

This screen allows you to configure whether or not the driver is visible for the PowerStudio client.

It must be remembered that although the driver may not be visible directly, it will still operate fully.

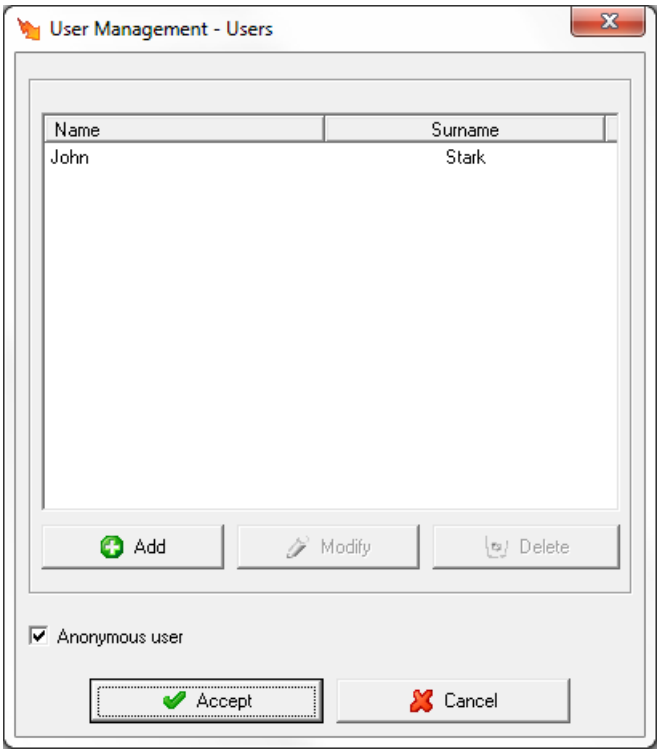
1.68.1.2 User management

Allows you to add, remove and modify users who will subsequently be managed from the application. Said users may have tags associated to them and permissions can be assigned for the different recharging points to which they will have access.

An anonymous user may be defined to which we can only assign devices (not tags).

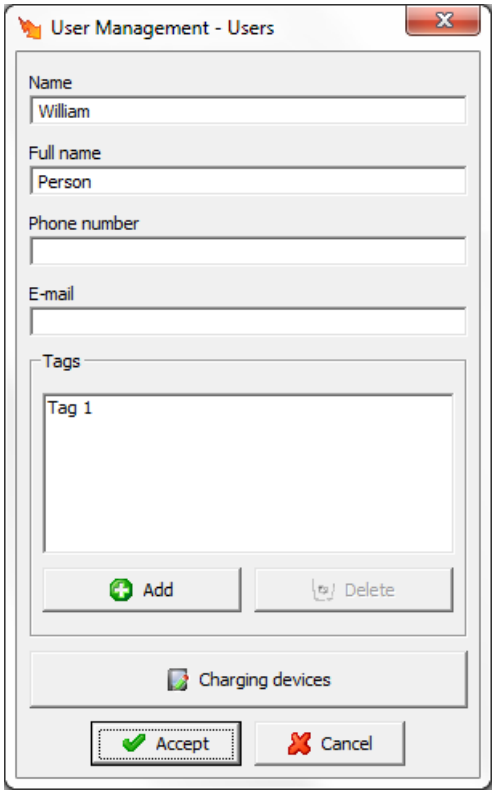
If an anonymous user exists, all tags, regardless of whether they belong to a user or not, will have access to the devices assigned to them.

User management screen:



The Anonymous user check box can activate or disable management of the devices to which all users will have access. If the check box is enabled, the allocation of devices to the anonymous user will be accessible as if it was any other user. If the check box is disabled, only those tags assigned to the user will have permissions and on the devices those to which the user has been granted access.

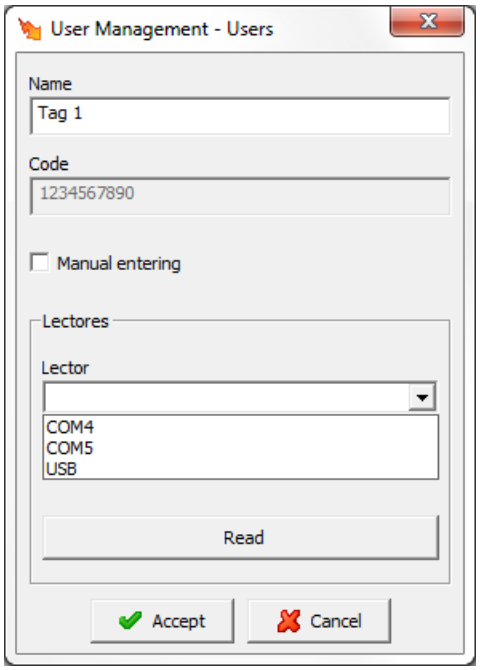
User management (add/modification) screen:



For each user the name and surnames (mandatory) can be stored, as well as the telephone number and e-mail address.

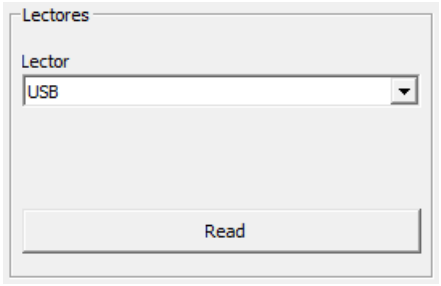
A list of the tags assigned to this user can also be managed.

Screen for adding a tag to a user:



Where:

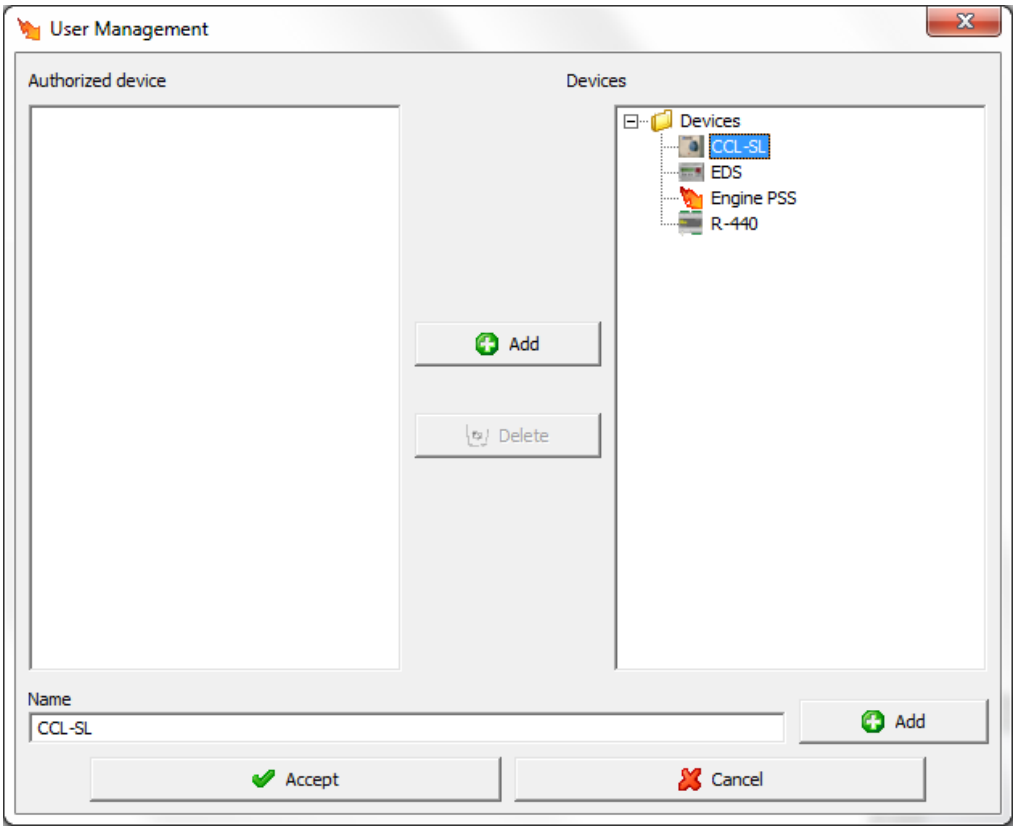
- Name: Is the name of the tag (descriptive name).
- Code: Is the internal code (unique) that can be entered manually (by enabling the check box Manual entering) or by reading from one of the readers assigned to the system:



Once a name and code have been assigned to the tag, we can store it for the user via the Accept button.

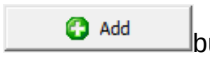
The system can have as many recharging devices as CCL and/or X2 equipment.
The GUSERS driver can be used to assign devices to users thus activating the possibility that said users perform recharging in the devices they have assigned.

Screen for assigning recharging devices to a user:

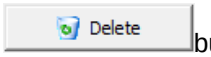


All the devices in the system appear in the windows (left and right):

- The left window contains the devices in which the user can recharge
- The right window contains the devices in which they cannot recharge (except, of course, when there is an anonymous user and they have one of these devices associated)

To authorise devices, select them in the right window and press the 

button to move them to the left window.

To unauthorise devices, select them in the left window and press the 

button to move them to the right window.

Once the modifications have been completed press the

button.

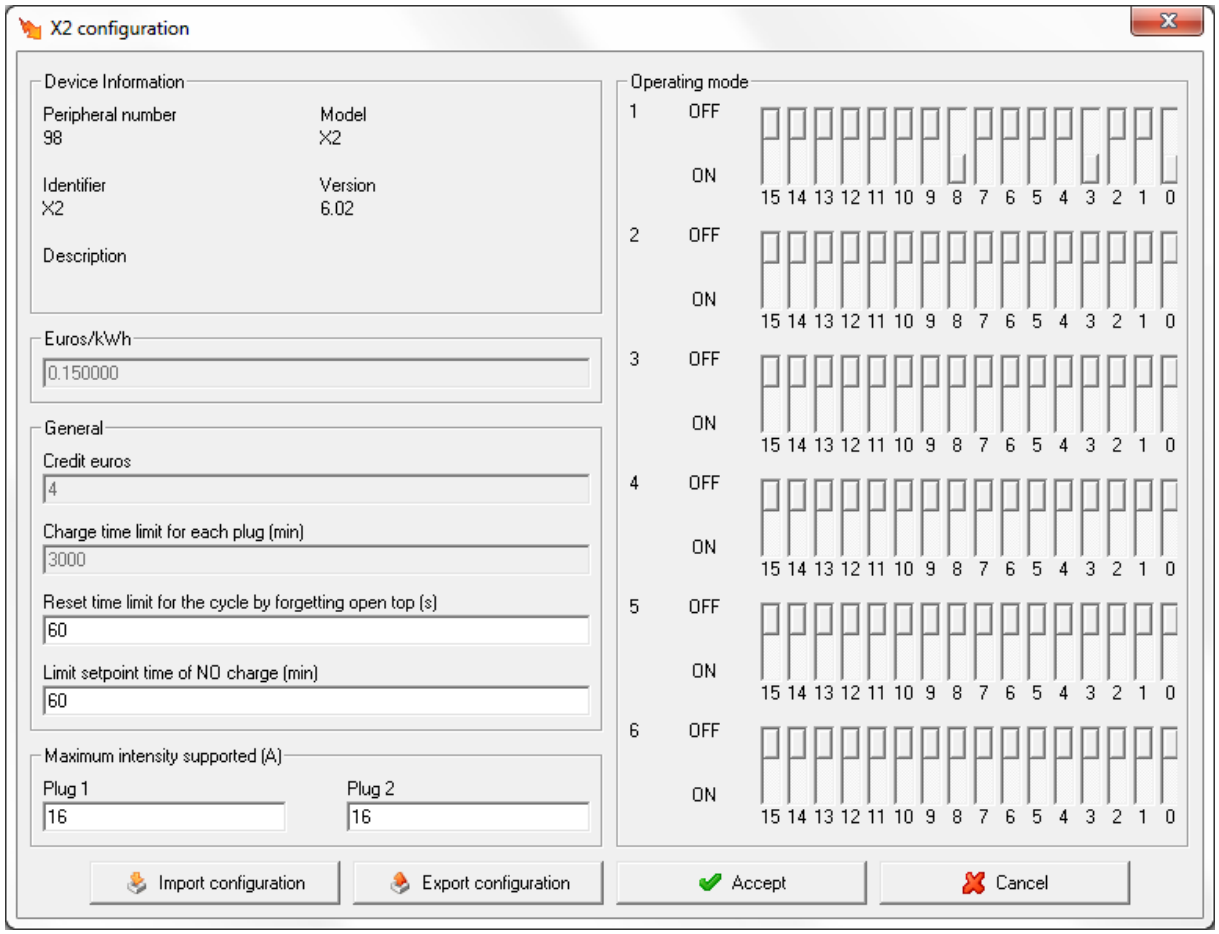
1.69.- X2

1.69.1 Driver options

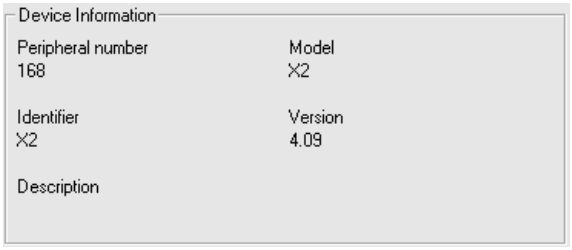
Options menu:

1.69.1.1 Device parameters

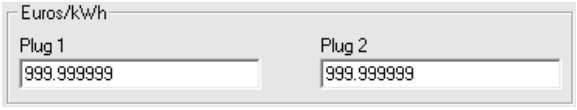
This screen allows the internal parameters of the device to be configured. On opening the dialogue box, the software will read the configuration of the device. When complete, click on "Accept" for the software to send information on changes to the device. In no case will the information be stored on the hard drive of the PC.



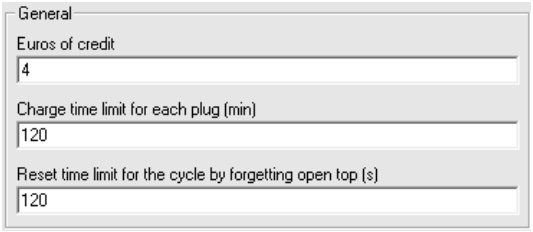
Some of these options will not be available depending on the version of the X2 device.



Displays general information about the device.



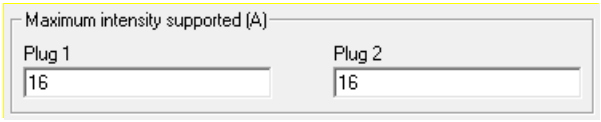
Value of the kWh which will be charged for the recharging. Allows you to enter a different price for each plug.



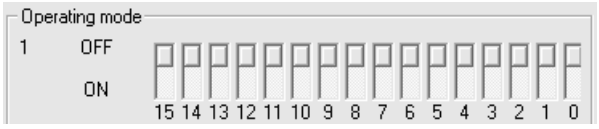
- **Euros of credit**: Credit in Euros that the X2 device will subtract from the card's credit on starting recharging. On completing recharging, the X3 device will be responsible for returning the credit not consumed. This parameter is common to both plugs.

- **Charge time limit for each plug (min)**: Maximum charge time. This parameter is common to both plugs.

- **Reset time limit for the cycle by forgetting open cover(s)**: Whole value in seconds.



Maximum current value supported by each terminal.



Operating mode 1:

- **Bit 0**: Paid or free service.
  - 0 = Paid 1 = Free
- **Bit 1**: Charge time limit.
  - 0 = Without 1 = With
- **Bit 2**: Credits.
  - 0 = Credit units 1 = All credit available
- **Bit 3**: "Anti-theft" meter system, Plug 1 and 2.
  - 0 = YES 1 = NO
- **Bit 4**: Continue cycle after a "Power Fail".
  - 0 = NO 1 = YES
- **Bit 5**: Plug 1. Functionality.

    - 0 = Normal operation 1 = Without service
- **Bit 6**: Plug 2. Functionality.
    - 0 = Normal operation 1 = Without service
- **Bit 7**: Kw cost.
    - 0 = On card 1 = On equipment
- **Bit 8**: "Anti-theft" meter system, Plug 2.
    - 0 = YES 1 = NO
- **Bit 9**: Reversal of the display digits.
    - 0 = left -> Ch1, right -> Ch2 1 = left -> Ch2, right -> Ch1
- **Bit 10**: Enable input for external meter.
    - 0 = NO 1 = YES
- **Bit 15**: Current measurement.
    - 0 = Multi-toroidal 1 = Mono-toroidal

2.- Appendices

2.1.- Variables

In order to use references to the variables measured by devices in Scada, reports, charts and tables, it will be necessary to know the encoding used by the software for each of them.

The basic encoding comprises the device name and the variable code separated by a dot.

name.variable

In this way the software will know which variable is involved and which device to ask for its value.

This encoding (variable.name) can be used in formulae, graphs and tables, although in the case of reports, graphs and tables we can display variables saved in value log files.

On those occasions we wish to filter a variable, as long as the variable can be filtered, for instance in the case of energy, the filter information will be added to the basic encoding.

name_filter@name_type_time:name.variable

Here the name of the filter and the name of the type of hour upon which the variable values will be filtered are indicated.

This type of encoding with filters may only be used in reports, graphs and tables, and with variables that have been saved in value log files.

For a better understanding, the variables are displayed in separate tables depending on the type of variable measured by the devices. The columns on the left correspond to the type of variable measured: whether the variable is instantaneous, maximum or minimum, the phase to which it corresponds, or any other information depending on the variable, and finally the code used (for example the instantaneous phase-neutral voltage of phase 1 will correspond to the code VI1). On the other hand, the columns to the right of each table will correspond to devices that can measure each of the variables, indicating with an ‘X’ if the variable will be measured by the device and with an ‘O’ if the variable will be measured depending on the version of the device.

2.1.1 Voltage

	Phase – neutral voltage											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	VI1	VI2	VI3	VI	VMX1	VMX2	VMX3	VMX	VMN1	VMN2	VMN3	VMN
CIRWATT	X	X	X									
CIRWATT B	X	X	X									
Computer Smart	X	X	X		X	X	X		X	X	X	
CVM 144	X	X	X		X	X	X		X	X	X	
CVM 96	X	X	X		X	X	X		X	X	X	
CVM B/BD	X	X	X	X								
CVM BC	X	X	X		X	X	X		X	X	X	
CVM-C10	X	X	X		X	X	X		X	X	X	
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVMK HAR	X	X	X									
CVM MINI	X	X	X		X	X	X		X	X	X	
CVM NET	X	X	X		X	X	X		X	X	X	
CVM NRG 96	X	X	X		X	X	X		X	X	X	
CVM SP	X				X				X			
CVM 1D				X				X				X
MK LCD	X				X							
MP3/MP4	X	X	X		X	X	X		X	X	X	
POWERNET	X	X	X		X	X	X		X	X	X	
QNA	O	O	O									

	Phase – phase voltage											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	VI12	VI23	VI31	VI123	VMX12	VMX23	VMX31	VMX123	VMN12	VMN23	VMN31	VMN123
CIRWATT	X	X	X									
Computer Smart	X	X	X	X	X	X	X	X	X	X	X	X
CVM 144	X	X	X		X	X	X		X	X	X	
CVM 96	X	X	X		X	X	X		X	X	X	
CVM B/BD	X	X	X	X								
CVM BC	X	X	X		X	X	X		X	X	X	
CVM-C10	X	X	X		X	X	X		X	X	X	
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVMK HAR	X	X	X									
CVM MINI	X	X	X		X	X	X		X	X	X	
CVM NET	X	X	X		X	X	X		X	X	X	
CVM NRG 96	X	X	X		X	X	X		X	X	X	
MK LCD	X				X							
POWERNET	X	X	X		X	X	X		X	X	X	
QNA	O	O	O									

	Nominal voltage		
	Instantaneous		
	L1	L2	L3
	VPNOMI1	VPNOMI2	VPNOMI3
QNA	X	X	X

	Neutral voltage		
	Instantaneous	Maximum	Minimum
	VNI	VNMX	VNMN
CVM K2	X	X	X
QNA	O		

	Absolute minimum – voltage					
	All registers			Valid registers		
	L1	L2	L3	L1	L2	L3
	V1MINT	V2MINT	V3MINT	V1MINV	V2MINV	V3MINV
QNA	O	O	O	O	O	O

	Lower percentile [5%] – voltage					
	All registers			Valid registers		
	L1	L2	L3	L1	L2	L3
	V1INFT	V2INFT	V3INFT	V1INFV	V2INFV	V3INFV

QNA	O	O	O	O	O	O

	Higher percentile [95%] – voltage					
	All registers			Valid registers		
	L1	L2	L3	L1	L2	L3
	V1SUPT	V2SUPT	V3SUPT	V1SUPV	V2SUPV	V3SUPV
QNA	O	O	O	O	O	O

	Absolute maximum – Voltage					
	All registers			Valid registers		
	L1	L2	L3	L1	L2	L3
	V1MAXT	V2MAXT	V3MAXT	V1MAXV	V2MAXV	V3MAXV
QNA	O	O	O	O	O	O

	Voltage distortion								
	Instantaneous			Maximum			Minimum		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
	DVI1	DVI2	DVI3	DVMX1	DVMX2	DVMX3	DVMN1	DVMN2	DVMN3
CVM 144	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X
CVM B/BD	O	O	O						
CVM BC	X	X	X	X	X	X	X	X	X
CVM-C10	X	X	X	X	X	X	X	X	X
CVM K	O	O	O						
CVM K2	X	X	X	X	X	X	X	X	X
CVMK HAR	X	X	X						
CVM MINI	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X
CVM SP	X			X			X		
POWERNET	X	X	X	X	X	X	X	X	X
QNA	X	X	X						

	Voltage distortion		
	Instantaneous	Maximum	Minimum
	DVI	DVMX	DVMN
Computer Smart	X	X	X

	Voltage distortion on neutral		
	Instantaneous	Maximum	Minimum
	DVNI	DVNMX	DVNMN
CVM K2	X	X	X

	Voltage distortion – Higher percentile [95%]							
	All registers				Valid registers			
	L1	L2	L3	III	L1	L2	L3	III
	DV1SUPT	DV2SUPT	DV3SUPT	DVSUPT	DV1SUPV	DV2SUPV	DV3SUPV	DVSUPV
QNA	O	O	O	O	O	O	O	O

	Phase – neutral voltage Net		
	L1	L2	L3
	VI1N	VI2N	VI3N
AFQ	X	X	X

2.1.2 Current

	Current											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	AI1	AI2	AI3	AI	AMX1	AMX2	AMX3	AMX	AMN1	AMN2	AMN3	AMN
CIRWATT	X	X	X									
CIRWATT B	X	X	X									
CVM 144	X	X	X		X	X	X		X	X	X	
CVM 96	X	X	X		X	X	X		X	X	X	
CVM B/BD	X	X	X	X								
CVM BC	X	X	X		X	X	X		X	X	X	
CVM-C10	X	X	X		X	X	X		X	X	X	
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVMK HAR	X	X	X									
CVM MINI	X	X	X		X	X	X		X	X	X	
CVM NET	X	X	X		X	X	X		X	X	X	
CVM NRG 96	X	X	X		X	X	X		X	X	X	
CVM SP	X				X				X			
CVM 1D				X				X				X
MK LCD	X				X							
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
POWERNET	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Current		
	Instantaneous	Maximum	Minimum
	AI	AMX	AMN
Computer Smart	X	X	X

	Neutral current		
	Instantaneous	Maximum	Minimum
	ANI	ANMX	ANMN
CVM 144	O	O	O
CVM 96	O	O	O
CVM B/BD	O		
CVM BC	O	O	O
CVM-C10	X	X	X
CVM K	O		
CVM K2	X	X	X
CVM MINI	X	X	X
CVM NET	X	X	X
CVM NRG 96	X	X	X
QNA	O		

	Diferential current		
	Instantaneous	Maximum	Minimum
	AELI	AELMX	AELMN
Computer Smart	X	X	X
CVM 144	O	O	O
MP3/MP4	X		

	Current distortion								
	Instantaneous			Maximum			Minimum		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
	DAI1	DAI2	DAI3	DAMX1	DAMX2	DAMX3	DAMN1	DAMN2	DAMN3
CVM 144	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X
CVM B/BD	O	O	O						
CVM BC	X	X	X	X	X	X	X	X	X
CVM-C10	X	X	X	X	X	X	X	X	X
CVM K	O	O	O						
CVM K2	X	X	X	X	X	X	X	X	X
CVMK HAR	X	X	X						
CVM MINI	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X
CVM SP	X			X			X		
POWERNET	X	X	X	X	X	X	X	X	X
QNA	O	O	O						

	Current distortion on neutral		
	Instantaneous	Maximum	Minimum
	DANI	DANMX	DANMN
CVM K2	X	X	X

	Current Net			Current Load		
	L1	L2	L3	L1	L2	L3
	AI1N	AI2N	AI3N	AI1L	AI2L	AI3L
AFQ	X	X	X	X	X	X

	Current distortion Net			Current distortion Load		
	L1	L2	L3	L1	L2	L3
	DAI1N	DAI2N	DAI3N	DAI1L	DAI2L	DAI3L
AFQ	X	X	X	X	X	X

	Current escale		
	Instantaneous	Maximum	Minimum
	ESCALEI	ESCALEMX	ESCALEMN
Computer Smart	X	X	X

	Current distortion		
	Instantaneous	Maximum	Minimum
	DAI	DAMX	DAMN
Computer Smart	X	X	

2.1.3 Frequency

	Frequency		
	Instantaneous	Maximum	Minimum
	HZI	HZMX	HZMN
CIRWATT	X		
Computer Smart	X	X	X
CVM 144	X	X	X
CVM 96	X	X	X
CVM B/BD	X		
CVM BC	X	X	X
CVM-C10	X	X	X
CVM K	X		
CVM K2	X	X	X
CVM K HAR	X		
CVM MINI	X	X	X
CVM NET	X	X	X
CVM NRG 96	X	X	X
CVM SP	X	X	X
MK LCD	X	X	
MP3/MP4	X	X	X
POWERNET	X	X	X
QNA	X		

	Absolute minimum – Frequency	
	All registers	Valid registers
	HZMINT	HZMINV
QNA	O	O

	Lower percentile [5%] – Frequency	
	All registers	Valid registers
	HZINFT	HZINFV
QNA	O	O

	Upper percentile [95%] – Frequency	
	All registers	Valid registers
	HZSUPT	HZSUPV
QNA	O	O

	Absolute maximum – Frequency	
	All registers	Valid registers
	HZMAXT	HZMAXV
QNA	O	O

	Net Frequency
	HZIN
AFQ	X

2.1.4 Power

	Apparent power consumed											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	VAI1	VAI2	VAI3	VAI	VAMX1	VAMX2	VAMX3	VAMX	VAMN1	VAMN2	VAMN3	VAMN
CIRWATT	X	X	X	X								
CIRWATT B	X	X	X	X								
Computer Smart				X				X				X
CVM 144	X	X	X	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM B/BD	X	X	X	X								
CVM BC	X	X	X	X	X	X	X	X	X	X	X	X
CVM-C10	X	X	X	X	X	X	X	X	X	X	X	X
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM SP	X				X				X			
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
POWERNET				X				X				X
QNA				O								

	Apparent power generated											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	NVAI1	NVAI2	NVAI3	NVAI	NVAMX1	NVAMX2	NVAMX3	NVAMX	NVAMN1	NVAMN2	NVAMN3	NVAMN
Computer Smart				X				X				X
CVM-C10	X	X	X	X	X	X	X	X	X	X	X	X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
QNA				O								

	Active power consumed											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	API1	API2	API3	API	APMX1	APMX2	APMX3	APMX	APMN1	APMN2	APMN3	APMN
CIRWATT	X	X	X	X								
CIRWATT B	X	X	X	X								
Computer Smart				X				X				X
CVM 144	X	X	X	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM B/BD	X	X	X	X								
CVM BC	X	X	X	X	X	X	X	X	X	X	X	X
CVM-C10	X	X	X	X	X	X	X	X	X	X	X	X
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM SP	X				X				X			
CVM 1D				X				X				X
MK LCD	X				X							
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
POWERNET	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Active power generated											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	NAPI1	NAPI2	NAPI3	NAPI	NAPMX1	NAPMX2	NAPMX3	NAPMX	NAPMN1	NAPMN2	NAPMN3	NAPMN
Computer Smart				X				X				X
CVM-C10	X	X	X	X	X	X	X	X	X	X	X	X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Capacitive power consumed											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	CPI1	CPI2	CPI3	CPI	CPMX1	CPMX2	CPMX3	CPMX	CPMN1	CPMN2	CPMN3	CPMN
CIRWATT	X	X	X	X								
CIRWATT B	X	X	X	X								
Computer Smart				X				X				X
CVM 144	X	X	X	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM B/BD	X	X	X	X								
CVM BC	X	X	X	X	X	X	X	X	X	X	X	X
CVM-C10	X	X	X	X	X	X	X	X	X	X	X	X
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM SP	X				X				X			
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
POWERNET	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Capacitive power generated											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	NCPI1	NCPI2	NCPI3	NCPI	NCPMX1	NCPMX2	NCPMX3	NCPMX	NCPMN1	NCPMN2	NCPMN3	NCPMN
Computer Smart				X				X				X
CVM-C10	X	X	X	X	X	X	X	X	X	X	X	X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Inductive power consumed											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	IPI1	IPI2	IPI3	IPI	IPMX1	IPMX2	IPMX3	IPMX	IPMN1	IPMN2	IPMN3	IPMN
CIRWATT	X	X	X	X								
CIRWATT B	X	X	X	X								
Computer Smart				X				X				X
CVM 144	X	X	X	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM B/BD	X	X	X	X								
CVM BC	X	X	X	X	X	X	X	X	X	X	X	X
CVM-C10	X	X	X	X	X	X	X	X	X	X	X	X
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X

CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM SP	X				X				X			
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
POWERNET	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Inductive power generated											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	NIPI1	NIPI2	NIPI3	NIPI	NIPMX1	NIPMX2	NIPMX3	NIPMX	NIPMN1	NIPMN2	NIPMN3	NIPMN
Computer Smart				X				X				X
CVM-C10	X	X	X	X	X	X	X	X	X	X	X	X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Power consumed factor											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	PFI1	PFI2	PFI3	PFI	PFMX1	PFMX2	PFMX3	PFMX	PFMN1	PFMN2	PFMN3	PFMN
CIRWATT	X	X	X									
CIRWATT B	X	X	X	X								
Computer Smart				X				X				X
CVM 144	X	X	X	X	X	X	X	X	X	X	X	X
CVM 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM B/BD	X	X	X	X								
CVM BC	X	X	X	X	X	X	X	X	X	X	X	X
CVM-C10	X	X	X	X	X	X	X	X	X	X	X	X
CVM K	X	X	X	X								
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM SP	X				X				X			
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
POWERNET	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Power generated factor											
	Instantaneous				Maximum				Minimum			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	NPFI1	NPFI2	NPFI3	NPFI	NPFMX1	NPFMX2	NPFMX3	NPFMX	NPFMN1	NPFMN2	NPFMN3	NPFMN
Computer Smart				X				X				X
CVM-C10	X	X	X	X	X	X	X	X	X	X	X	X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI	X	X	X	X	X	X	X	X	X	X	X	X
CVM NET	X	X	X	X	X	X	X	X	X	X	X	X
CVM NRG 96	X	X	X	X	X	X	X	X	X	X	X	X
CVM 1D				X				X				X
MP3/MP4	X	X	X	X	X	X	X	X	X	X	X	X
QNA	O	O	O									

	Cos φ consumed											
	Instantáneas				Máximas				Mínimas			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	COSI1	COSI2	COSI3	COSI	COSMX1	COSMX2	COSMX3	COSMX	COSMN1	COSMN2	COSMN3	COSMN
Computer Smart				X				X				X
CVM-C10	X	X	X	X	X	X	X	X	X	X	X	X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI				X				X				X
CVM NET				X				X				X
CVM NRG 96				X				X				X

	Cos φ generated											
	Instantáneas				Máximas				Mínimas			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
	NCOSI1	NCOSI2	NCOSI3	NCOSI	NCOSMX1	NCOSMX2	NCOSMX3	NCOSMX	NCOSMN1	NCOSMN2	NCOSMN3	NCOSMN
Computer Smart				X				X				X
CVM-C10	X	X	X	X	X	X	X	X	X	X	X	X
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM MINI				X				X				X
CVM NET				X				X				X
CVM NRG 96				X				X				X

	Active power escale		
	Instantánea	Máxima	Mínima
	AP_ESCALEI	AP_ESCALEMX	AP_ESCALEMN
Computer Smart	X	X	X

	Reactive power escale		
	Instantánea	Máxima	Mínima
	RP_ESCALEI	RP_ESCALEMX	RP_ESCALEMN
Computer Smart	X	X	X

	Apparent power escale		
	Instantánea	Máxima	Mínima
	VA_ESCALEI	VA_ESCALEMX	VA_ESCALEMN
Computer Smart	X	X	X

2.1.5 Energy

	Apparent energy			
	Consumed		Generated	
	III	Rate y (y:1..9)	III	Rate y (y:1..9)
	VAE	VAETy	NVAE	NVAETy
CVM K2	X	O	X	O
CVM MINI	X		X	
CVM NET	X		X	
CVM NRG 96	X		X	
MP3/MP4	X		X	

	Active energy Consumed								
	L1	L2	L3	III	Partial	Rate y		Contract x (x:1..3)	
						y:1..3	y:4..9	Rate y (y:1..9)	Total
	AE1	AE2	AE3	AE	PAE	AETy	AETy	AECxTy	AECxTOT
CIRWATT	X	X	X	X				X	X
CIRWATT B				X					
CVM 144				X					
CVM 96				X					
CVM B/BD				X		O			
CVM BC				X					
CVM K				O		O			
CVM K2				X		O	O		
CVM MINI				X					
CVM NRG 96				X					
CVM SP				X					
CVM 1D				X	X				
EDMK				X	O				
MK D				X	O	O			
MK LCD				X	X				
MP3/MP4	X	X	X	X					
POWERNET				X					
QNA				O					

	Active energy generated								
	L1	L2	L3	III	Partial	Rate		Contract x (x:1..3)	
						y:1..3	y:4..9	Rate y (y:1..9)	Total
	NAE1	NAE2	NAE3	NAE	PNAE	NAETy	NAETy	NAECxTy	NAECxTOT
CIRWATT	X	X	X	X				X	X
CIRWATT B				X					
CVM B/BD				O		O			
CVM K				O		O			
CVM K2				X		O	O		
CVM MINI				X					
CVM NET				X					
CVM NRG 96				X					
CVM 1D				X	X				
EDMK				O	O				
MK D				O	O	O			
MP3/MP4	X	X	X	X					
QNA				O					

	Capacitive energy consumed													
	L1	L2	L3	III	Partial	Rate		2nd quadrant (2Q)						
						y:1..3	y:4..9	L1	L2	L3	III	Contract x (x:1..3)		
												Rate y (y:1..9)	Total	
	CE1	CE2	CE3	CE	PCE	CETy	CETy	CE2Q1	CE2Q2	CE2Q3	CE2Q	CE2QCxTy	CE2QCxTOT	
CIRWATT								X	X	X	X	X	X	
CIRWATT B											X			
CVM 144				X										
CVM 96				X										
CVM B/BD				X		O								
CVM BC				X										
CVM K				O		O								
CVM K2				X		O	O							
CVM MINI				X										
CVM NET				X										
CVM NRG 96				X										
CVM SP				X										
CVM 1D				X	X									
EDMK				X	O									
MK D				X	O	O								
MP3/MP4	X	X	X	X										
POWERNET				X										
QNA				O										

	Capacitive energy generated									
	III	Partial	Rate		4th quadrant (4Q)					
			y:1..3	y:4..9	L1	L2	L3	III	Contract x (x:1..3)	
									Rate y (y:1..9)	Total
	NCE	PNCE	NCETy	NCETy	CE4Q1	CE4Q2	CE4Q3	CE4Q	CE4QCxTy	CE4QCxTOT
CIRWATT					X	X	X	X	X	X
CIRWATT B								X		
CVM B/BD	X		O							
CVM BC	X									
CVM K	O		O							
CVM K2	X		O	O						
CVM MINI	X									
CVM NET	X									
CVM NRG 96	X									
CVM 1D	X	X								
EDMK	O	O								
MK D	O	O	O							
MP3/MP4	X									
QNA	O									

	Inductive energy consumed													
	L1	L2	L3	III	Partial	Rate		1st quadrant (1Q)						
						y:1..3	y:4..9	L1	L2	L3	III	Contract x (x:1..3)		
												Rate y (y:1..9)	Total	
	IE1	IE2	IE3	IE	PIE	IETy	IETy	IE1Q1	IE1Q2	IE1Q3	IE1Q	IE1QCxTy	IE1QCxTOT	
CIRWATT								X	X	X	X	X	X	
CIRWATT B											X			
CVM 144				X										
CVM 96				X										
CVM B/BD				X		O								
CVM BC				X										
CVM K				O		O								
CVM K2				X		O	O							
CVM MINI				X										
CVM NET				X										
CVM NRG 96				X										
CVM SP				X										
CVM 1D				X	X									
EDMK				X	O									
MK D				X	O	O								
MP3/MP4	X	X	X	X										
POWERNET				X										
QNA				O										

	Inductive energy generated									
	III	Partial	Rate		3rd quadrant (3Q)					
					L1	L2	L3	III	Contract x (x:1..3)	
			y:1..3	y:4..9					Rate y (y:1..9)	Total
	NIE	PNIE	NIETy	NIETy	IE3Q1	IE3Q2	IE3Q3	IE3Q	IE3QCxTy	IE3QCxTOT
CIRWATT					X	X	X	X	X	X
CIRWATT B								X		
CVM B/BD	X		O							
CVM BC	X									
CVM K	O		O							
CVM K2	X		O	O						
CVM MINI	X									
CVM NET	X									
CVM NRG 96	X									
CVM 1D	X	X								
EDMK	O	O								
MK D	O	O	O							
MP3/MP4	X									
QNA	O									

All energy variables can be filtered.

2.1.6 Maximum demand

	Maximum demand consumed									
	Instantaneous					Maximum				
	L1	L2	L3	III	Rate y (y:1..3)	L1	L2	L3	III	Rate y (y:1..3)
	MDI1	MDI2	MDI3	MDI	MDITy	MDMX1	MDMX2	MDMX3	MDMX	MDMXTy
CVM 144	O	O	O	O		O	O	O	O	
CVM 96	O	O	O	O		O	O	O	O	
CVM B/BD					O					O
CVM BC	O	O	O	O		O	O	O	O	
CVM K					O					O
CVM MINI	O	O	O	O		O	O	O	O	
CVM NET	O	O	O	O		O	O	O	O	
CVM NRG 96	O	O	O	O		O	O	O	O	
CVM SP	O					O				
CVM 1D				X					X	
MP3/MP4	X	X	X	X		X	X	X	X	
POWERNET	O	O	O	O		O	O	O	O	

	Maximum demand generated									
	Instantaneous					Maximum				
	L1	L2	L3	III	Rate y (y:1..3)	L1	L2	L3	III	Rate y (y:1..3)
	NMDI1	NMDI2	NMDI3	NMDI	NMDITy	NMDMX1	NMDMX2	NMDMX3	NMDMX	NMDMXTy
CVM NET	O	O	O	O		O	O	O	O	
CVM NRG 96	O	O	O	O		O	O	O	O	
MP3/MP4	X	X	X	X		X	X	X	X	

	Maximum demand of apparent power							
	Consumed				Generated			
	Instantaneous		Maximum		Instantaneous		Maximum	
	MDVAI	Rate y (y:1..9) MDVAITy	MDVAMX	Rate y (y:1..9) MDVAMXTy	NMDVAI	Rate y (y:1..9) NMDVAITy	NMDVAMX	Rate y (y:1..9) NMDVAMXTy
CVM K2	X	O	X	O	X	O	X	O

	Maximum demand of active power							
	Consumed				Generated			
	Instantaneous		Maximum		Instantaneous		Maximum	
	MDAPI	Rate y (y:1..9) MDAPITy	MDAPMX	Rate y (y:1..9) MDAPMXTy	NMDAPI	Rate y (y:1..9) NMDAPITy	NMDAPMX	Rate y (y:1..9) NMDAPMXTy
CVM K2	X	O	X	O	X	O	X	O

	Maximum current demand							
	Instantaneous				Maximum			
	L1	L2	L3	III	L1	L2	L3	III
	MDAI1	MDAI2	MDAI3	MDAI	MDAMX1	MDAMX2	MDAMX3	MDAMX
CVM K2	X	X	X	X	X	X	X	X

	Maximum current demand rate y (y:1..9)							
	Instantaneous				Maximum			
	L1	L2	L3	III	L1	L2	L3	III
	MDAI1Ty	MDAI2Ty	MDAI3Ty	MDAITy	MDAMX1Ty	MDAMX2Ty	MDAMX3Ty	MDAMXTy
CVM K2	O	O	O	O	O	O	O	O

All maximum demand variables can be filtered.

2.1.7 Harmonics

	Voltage harmonics	
	Instantaneous	Maximum
	ARMxV	ARMxVMX
Computer Smart	X: (3, 5, 7, 9, 11, 13)	X: (3, 5, 7, 9, 11, 13)

	Voltage harmonics							
	L1		L2		L3		Neutral	
	x:1..15	x:16..50	x:1..15	x:16..50	x:1..15	x:16..50	x:1..15	x:16..50
	ARMxV1		ARMxV2		ARMxV3		ARMxVN	
CVM K2	X	X	X	X	X	X	X	X
CVM K HAR	X	X	X	X	X	X		
CVM MINI	X		X		X			
CVM NET	X		X		X			
CVM NRG 96	X		X		X			
QNA	O	O	O	O	O	O		

	Current harmonics	
	Instantaneous	Maximum
	ARMxA	ARMxAMX
Computer Smart	X: (3, 5, 7, 9, 11, 13)	X: (3, 5, 7, 9, 11, 13)

	Current harmonics											
	L1			L2			L3			Neutral		
	x:1..15	x:16..31	x:32..50	x:1..15	x:16..31	x:32..50	x:1..15	x:16..31	x:32..50	x:1..15	x:16..31	x:32..50
	ARMxA1			ARMxA2			ARMxA3			ARMxAN		
CVM 144	O			O			O					
CVM 96	O	O		O	O		O	O				
CVM K2	X	X	X	X	X	X	X	X	X	X	X	X
CVM K HAR	X	X	X	X	X	X	X	X	X			
CVM MINI	X			X			X					
CVM NET	X			X			X					
CVM NRG 96	X			X			X					
QNA	O	O	O	O	O	O	O	O	O			

	Maximum voltage harmonics (3 sec.)		
	L1	L2	L3
	ARMyMXCV1 (y:1..50)	ARMyMXCV2 (y:1..50)	ARMyMXCV3 (y:1..50)
QNA	O	O	O

	Maximum voltage harmonics (10 mins.)		
	L1	L2	L3
	ARMyMXPV1 (y:1..50)	ARMyMXPV2 (y:1..50)	ARMyMXPV3 (y:1..50)
QNA	O	O	O

2.1.8 Pst / Plt

	Pst		
	L1	L2	L3
	PST1	PST2	PST3
CVM K2	O	O	O
QNA	O	O	O

	Pst – Upper percentile [95%]					
	All registers			Valid registers		
	L1	L2	L3	L1	L2	L3
	PST1SUPT	PST2SUPT	PST3SUPT	PST1SUPV	PST2SUPV	PST3SUPV
QNA	O	O	O	O	O	O

	Pst – Input x (x:1..20)		
	L1	L2	L3
	PST1DIx	PST2DIx	PST3DIx
QNA	O	O	O

	Plt		
	L1	L2	L3
	PLT1	PLT2	PLT3
CVM K2	O	O	O
QNA	O	O	O

	Plt – Upper percentile [95%]					
	All registers			Valid registers		
	L1	L2	L3	L1	L2	L3
	PLT1SUPT	PLT2SUPT	PLT3SUPT	PLT1SUPV	PLT2SUPV	PLT3SUPV
QNA	O	O	O	O	O	O

2.1.9 Inputs and Outputs

	Digital inputs			
	x:1..4	x:4..18	x:19..24	x:25..50
	DIx			
CIRWATTB	O			
CVM 144	O			
CVM K2	O	O	O	
CVM R8	O	O		
EDS	X	X: (5..8)		
EDS Embedded	X	X: (5..8)		
LM 24	X	X	X	
LM 25-M	X	X	X	X: 25
LM-4 A	X (x:1, 2)			
LM50	X	X	X	X
LM50 Plus	X	X	X	X
MR4	X	X		
TCP50 ALARM	X	X	X	X

	Analogue inputs
	X (1..4)
	AIx
LM-4 A	X

	Analogue inputs											
	Instantaneous				Maximum				Minimum			
	x:1..1	x:2..3	x:4..8	x:9..24	x:1..1	x:2..3	x:4..8	x:9..24	x:1..1	x:2..3	x:4..8	x:9..24
	AIIx				AIMXx				AIMNx			
CVM 144	O	O			O	O			O	O		
CVM K2	O	O	O	O								
CVM R8	O	O	O		O	O	O		O	O	O	
CVM MINI	X				X				X			
MP3/MP4	X				X				X			

The analogue input of the MP3/MP4 and CVM-MINI devices will correspond to the temperature variable measured by this type of device.

	Digital outputs						
	1	2	3	4	x:5..18	x:19..20	x:21..24
	DO1	DO2	DO3	DO4	DOx		
CIRWATT	X	X	X	X			
CIRWATT B	X	X	X	X			
CVM 144	O	O					
CVM 96	O	O					
CVM BC	O	O					
CVM K2	O	O	O	O	O	O	O
CVM R8	O	O	O	O	O		
CVM MINI	X	X					
CVM NET	X	X					
CVM NRG 96	X						
CVM SP	O	O					
EDMK	O	O					
EDS	X	X	X	X	X: (5..8)		
EDS Embedded	X	X	X	X	X: (5..6)		
LM-4 A	X	X					
MK LCD	X						
MP3/MP4	X	X					
MR4	X	X	X	X			
QNA	O	O	O	O	O	O	

Digital outputs may be forced to 0 (the output will remain open) or to 1 (the output will close).

2.1.10 Counters

	Counter	
	x:1..24	x:25..50
	Cx	
CIRWATTB	O: (1..4)	
CVM K2	O	
EDS	X: (1..8)	
EDS Embedded	X: (1..8)	
LM 24	X	
LM 25-M	X	X: 25
LM-4 A	X (x: 1, 2)	
LM50	X	X
LM50 Plus	X	X

The values of the counters on the LM50 devices may be forced between 0 and the maximum value permitted by the device. See the device manual for more details on this maximum value.

All counter variables can be filtered.

2.1.11 Special device variables

2.1.11.1 AFQ

	Net			Load		
	L1	L2	L3	L1	L2	L3
Active power	API1N	API2N	API3N	API1L	API2L	API3L
Reactive power	RPI1N	RPI2N	RPI3N	RPI1L	RPI2L	RPI3L
Apparent power	VAI1N	VAI2N	VAI3N	VAI1L	VAI2L	VAI3L
Power factor	PFI1N	PFI2N	PFI3N	PFI1L	PFI2L	PFI3L

	Current harmonics					
	Net			Load		
	L1	L2	L3	L1	L2	L3
Fundamental	ARM1A1N	ARM1A2N	ARM1A3N	ARM1A1L	ARM1A2L	ARM1A3L
Harmonic 3	ARM3A1N	ARM3A2N	ARM3A3N	ARM3A1L	ARM3A2L	ARM3A3L
Harmonic 5	ARM5A1N	ARM5A2N	ARM5A3N	ARM5A1L	ARM5A2L	ARM5A3L
Harmonic 7	ARM7A1N	ARM7A2N	ARM7A3N	ARM7A1L	ARM7A2L	ARM7A3L
Harmonic 9	ARM9A1N	ARM9A2N	ARM9A3N	ARM9A1L	ARM9A2L	ARM9A3L
Harmonic 11	ARM11A1N	ARM11A2N	ARM11A3N	ARM11A1L	ARM11A2L	ARM11A3L
Harmonic 13	ARM13A1N	ARM13A2N	ARM13A3N	ARM13A1L	ARM13A2L	ARM13A3L
Harmonic 15	ARM15A1N	ARM15A2N	ARM15A3N	ARM15A1L	ARM15A2L	ARM15A3L
Harmonic 17	ARM17A1N	ARM17A2N	ARM17A3N	ARM17A1L	ARM17A2L	ARM17A3L
Harmonic 19	ARM19A1N	ARM19A2N	ARM19A3N	ARM19A1L	ARM19A2L	ARM19A3L
Harmonic 21	ARM21A1N	ARM21A2N	ARM21A3N	ARM21A1L	ARM21A2L	ARM21A3L
Harmonic 23	ARM23A1N	ARM23A2N	ARM23A3N	ARM23A1L	ARM23A2L	ARM23A3L
Harmonic 25	ARM25A1N	ARM25A2N	ARM25A3N	ARM25A1L	ARM25A2L	ARM25A3L

2.1.11.2 C-14d

	Current	Current distortion	Cos φ	Active Quadrant	Alarm active	Digital output	
						Alarm	x:1..14
	AI	DAI	COSI	QUADRANT	ALARM	DO0	DOx
C-14d	X	X	X	X	X	X	X

Active Quadrant	*Value*
Energy consumed	0
Energy consumed. Capacitive system	1
Energy consumed. Inductive system	2
Energy generated	4
Energy generated. Capacitive system	5
Energy generated. Inductive system	6

Alarm active	*Value*
None	0
Compensation alarm (-CE)	1
Overcurrent alarm (-AE)	2
Distortion alarm (-dE)	3
Setup error alarm	4
Expansion card communication alarm	5
Referenced voltage error alarm	6

Alarm digital output	*Value*
Not enabled	0
Enabled	1

2.1.11.3 CBS-4

	Differential current		Status		
	Instantaneous	Detected	Of the channel	Of the protection	Pre-alarm relay
	Channel x (x:1..4)				
	AELIx	AELDx	STx	DOx	DO0
CBS-4	X	X	X	X	X

Channel status	*Value*
Not Triggered	0
Differential current exceeded	1
Toroid error	2

Protection status	*Value*
Not enabled	0
Enabled	1

Pre-alarm relay status	*Value*
Not enabled	0
Enabled	1

On CBS-4 devices we can reset the x channel forcing the status variable of the RSTx to value 0 or remotely trigger the channel forcing the variable to 1.

2.1.11.4 CBS-8, CDR-8

	Differential current		Status		
	Instantaneous	Detected	Of the channel	Of the protection	Pre-alarm relay
	Canal x (x:1..8)				
	AELIx	AELDx	STx	DOx	DO0
CBS-8	X	X	X	X	X
CDR-8	X	X	X	X	X

Status of the channel output	*Value*
Not Triggered	0
Differential current exceeded	1
Output triggered	2
Output locked	3

Pre-alarm relay status	*Value*
Not enabled	0
Enabled	1

On CBS-8 and CDR-8 devices we can reset the x channel forcing the status variable of the (STx) to value 16.

We can also remotely trigger the x channel forcing the RFCx variable to 1 to activate remote triggering or 0 to deactivate it.

2.1.11.5 CCL

	Plug x (x:1..6)
Total active energy	AEx
Partial active energy	AEPx
Active power	APIx
Digital output	DOx
Car connected	CCx
Digital input	AUXx
Bollard state	STATEx
Identifier	TAGx

2.1.11.6 CIRWATT

The following show the specific variables of the CIRWATT devices, the shared variables, such as voltage and current, are included in the corresponding variable table.

	Billing closures – absolute energy					
	Contract x (x: 1..3)					
	Rate y (y:1..9)			Total		
	Active	Inductive	Capacitive	Active	Inductive	Capacitive
	AEABSCxTy	IEABSCxTy	CEABSCxTy	AEABSCxTOT	IEABSCxTOT	CEABSCxTOT
CIRWATT	X	X	X	X	X	X

	Billing closures – Incremental energy					
	Contract x (x: 1..3)					
	Rate y (y:1..9)			Total		
	Active	Inductive	Capacitive	Active	Inductive	Capacitive
	AEINCCxTy	IEINCCxTy	CEINCCxTy	AEINCCxTOT	IEINCCxTOT	CEINCCxTOT
CIRWATT	X	X	X	X	X	X

	Billing closures – Power					
	Contract x (x: 1..3)					
	Rate y (y:1..9)			Total		
	Maximum demand	Power excesses	Power factor	Maximum demand	Power excesses	Power factor
	MDCxTy	EXCCxTy	PFCxTy	MDCxTOT	EXCCxTOT	FPCxTOT
CIRWATT	X	X	X	X	X	X

The power factor variable is calculated by the software using active and inductive energy.

	Power	
	Contract x (x: 1..3) Rate y (y: 1..9)	
	Contracted	Excesses by register
	CPWCxTy	REXCCxTy
CIRWATT	X	X

Power Excesses are calculated by the software for each curve register downloaded onto CIRWATT equipment.

2.1.11.7 COMPUTER SMART

	Temperature		
	Instantaneous	Maximum	Minimum
	AI1	AIMX	AIMN
Computer Smart	X	X	X

	Capacitor
	Number of x capacitor connexions
	X (1..12)
Computer Smart	NCCx

2.1.11.8 CVM-K2

The following shows the specific variables of the CVM-K2 devices, the shared variables, such as voltage and current, are included in the correponding variable table.

	Coeficient K_d					
	Voltage			Current		
	Instantaneous	Maximum	Minimum	Instantaneous	Maximum	Minimum
	KDVI	KDVMX	KDVMN	KDAI	KDAMX	KDAMN
CVM K2	X	X	X	X	X	X

	Coeficient K_a					
	Voltage			Current		
	Instantaneous	Maximum	Minimum	Instantaneous	Maximum	Minimum
	KAVI	KAVMX	KAVMN	KAAI	KAAMX	KAAMN
CVM K2	X	X	X	X	X	X

	Temperature		
	Instantaneous	Maximum	Minimum
	TI	TMX	TMN
CVM K2	X	X	X

	K Factor								
	Instantaneous			Maximum			Minimum		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
	KFAI1	KFAI2	KFAI3	KFAMX1	KFAMX2	KFAMX3	KFAMN1	KFAMN2	KFAMN3
CVM K2	X	X	X	X	X	X	X	X	X

	Crest factor								
	Instantaneous			Maximum			Minimum		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
	CFVI1	CFVI2	CFVI3	CFVMX1	CFVMX2	CFVMX3	CFVMN1	CFVMN2	CFVMN3
CVM K2	X	X	X	X	X	X	X	X	X

	Weighted Flicker		
	L1	L2	L3
	FWA1	FWA2	FWA3
CVM K2	X	X	X

2.1.11.9 DH-96

	Voltage			Current			Active power			Active energy
	Inst.	Max.	Min.	Inst.	Max.	Min.	Inst.	Max.	Min.	
	VI	VMX	VMN	AI	AMX	AMN	API	APMX	APMN	AE
DH-96 CPM	X	X	X	X	X	X	X	X	X	X

	Measured	Peak	Off-peak	Counter	Flow
	ME	PK	VL	C1	F1
DH-96 AC	X	X	X		
DH-96 CT				X	O
DH-96 DC	X	X	X		
DH-96 FT	X	X	X		
DH-96 SG	X	X	X		
DH-96 TMP	X	X	X		
DH-96 WG	X	X	X		

	Active power			Digital outputs				Active energy
	Inst.	Max.	Avg.	DO1	DO2	DO3	DO4	
	API	APMX	APAVG					AE
DH-96 CPP	X	X	X	X	X	X	X	X

2.1.11.10 EDS

	Flow
	x: 1..8
	Fx
EDS	X

2.1.11.11 MK D

	Active rate	Digital input		Counters		Digital output	
	ACTTARIFF	DI1	DI2	C1	C2	DO1	DO2
MK D	O	O	O	O	O	O	O

2.1.11.12 MP3 / MP4

	Instantaneous	Maximum	Minimum
Temperature	AII1	AIMX1	AIMN1

2.1.11.13 QNA

The following shows the specific variables of the QNA devices, the shared variables, such as voltage and current, have been included in the corresponding variable table.

	Event alarms								
	Power cut			Gap			Overvoltage		
	L1	L2	L3	L1	L2	L3	L1	L2	L3
	ALEVEI1	ALEVEI2	ALEVEI3	ALEVES1	ALEVES2	ALEVES3	ALEVEO1	ALEVEO2	ALEVEO3
QNA	X	X	X	X	X	X	X	X	X

Alarm event variables will activate (value 1) when an event is produced in the QNA and will remain active for 5 seconds. When these 5 seconds have elapsed without any new event taking place, the alarm will deactivate (value 0).

	Voltage phasor		Voltage-current phasor		
	L1-L2	L1-L3	L1	L2	L3
	FDV12	FDV13	FDVI1	FDVI2	FDVI3
QNA	O	O	O	O	O

	Counter of number of 10 cycle blocks					
	With EVQ			With voltage off limits		
	L1	L2	L3	L1	L2	L3
	STCBE1	STCBE2	STCBE3	STCVB1	STCVB2	STCVB3
QNA	X	X	X	X	X	X

	Counter of 150 cycle integrations					
	Of all STD parameters except voltage			Voltage		
	L1	L2	L3	L1	L2	L3
	STCIS1	STCIS2	STCIS3	STCIV1	STCIV2	STCIV3
QNA	X	X	X	X	X	X

	Coefficient K_d		Coefficient K_a	
	Voltage	Current	Voltage	Current
	KDV	KDA	KAV	KAA
QNA	O	O	O	O

	Imbalance-percentile higher than 95%	
	All registers	Valid registers
	UBSUPT	UBSUPV
QNA	O	O

	Total no. of registers	Registers without events	Value counters					
			Frequency	Frequency without events	Plt	Plt without events		
						L1	L2	L3
	NREGTOT	NREGEVQ	CVHZ	CVHZEVQ	CVPLT	CVPLT1EVQ	CVPLT2EVQ	CVPLT3EVQ
QNA	O	O	O	O	O	O	O	O

	Event log		
	L1	L2	L3
	HEVQ1	HEVQ2	HEVQ3
QNA	X	X	X

2.1.11.14 RGU-10 / RGU-10 RA

	RMS value		Status			
	Differential current	Differential current trigger	Pre-alarm trigger	Locking	Coil triggering	Device
	AELI	AELD	DO0		DO1	ST
RGU-10	X	X	X		X	
RGU-10 RA	X	X		X		X

	No. reconnection			
	Differential		Circuit breaker	
	Partial	Total	Partial	Total

	RCPD	RCTD	RCPM	RCTM
RGU-10 RA	X	X	X	X

Pre-alarm trigger output status	*Value*
Not enabled	0
Enabled	1

Locking output status	*Value*
Not locked	0
Locked	1

Coil trigger output status	*Value*
Not Tripped	0
Tripped	1

Status of the device	*Value*
Start	0
Rest	1
Earth differential trigger locking	2
Earth differential trigger waiting	3
Circuit breaking trigger locking	4
Circuit breaking trigger waiting	5
Toroid disconnected	6
External input enabled	7
Remote trigger	8
Test trigger	9
Manufacturing mode	10
Calibration mode	11

To carry out a channel reset on the RGU-10 devices the RST variable must be forced to value 0.

To carry out a remote triggering of the channel the RST variable should be forced to the value 1.

2.1.11.15 RRM-C

	Reconection counter	No. of reconnections selected	Time between reconnections	Device status
	RC	RN	RT	ST
RRM-C	X	X	X	X

Device status	*Value*
Unknown	65535
Connected	0
Locked	1
External trigger	2
Residual current device trigger	4
Communication trigger	8
External and communication trigger	10

On RRM-C devices the device status can be forced to 16 to reset it, or to 17 trigger the device externally.

2.1.11.16 TAGREADER

Tag	TAG
Time	TIME

2.1.11.17 TH-DG-RS485

The following show temperature, dew point and humidity variables:

	Temperature ºC			Temperature ºF		
	Inst.	Max.	Min.	Inst.	Max.	Min.
TH-DG-RS485	TCI	TCMX	TCMN	TFI	TFMX	TFMN

	Relative humidity %			Absolute humidity g/m^3		
	Inst.	Max.	Min.	Inst.	Max.	Min.
TH-DG-RS485	RHI	RHMX	RHMN	AHÍ	AHMX	AHMN

	Dew point ºC			Dew point ºF		
	Inst.	Max.	Min.	Inst.	Max.	Min.
TH-DG-RS485	DPCI	DPCMX	DPCMN	DPFI	DPFMX	DPFMN

2.1.11.18 TR8

The variables of the master module and slave modules of the TR8 device are shown below.

	Master		
	Current y (y:1..8)	Voltage	Digital inputsy (y:1..8)
	AIy	VI	DIy
TR8	X	X	X

	Slaves		
	Module xx (xx: 01..31)		
	Current y (y:1..8)	Voltage	Digital inputs y (y:1..8)
	MxxAIy	MxxVI	MxxDIy
TR8	X	X	X

2.1.11.19 TR16

The variables of the master module and slave modules of the TR16 device are shown below.

	Master				
	Current y (y:1..16)	Voltage	Temperature	Analog input 1	Digital inputs y (y: 1..3)
	AIy	VI	TI	AII	DIy
TR16	X	X	X	X	X

	Slaves					
	Module xx (xx:1..15)					
	Current y (y:1..16)	Voltage	Temperature	Analog input 1	Digital input y (y:1..3)	Current trigger threshold
	MOxxAIy	MOxxVI	MOxxTI	MOxxAII	MOxxDIy	MOxxMAT
TR16	X	X	X	X	X	X

2.1.11.20 X2

	Plug 1	Plug 2
Total active energy	AE1	AE2
Partial active energy	AEP1	AEP2
Active power	API1	API2
Digital output	DO1	DO2
Digital input	DI1	
Euros / kWh	EKWH1	EKWH2
Identifier	TAG1	TAG2
Bollard state	STATE1	STATE2

2.1.12 Graph variables and special tables

Special variables for graphs and tables serve to indicate to PowerStudio that a graph or non-standard table is desired. On a non-standard graph or table the values that appear in the X and Y axis, rows and columns on a table, may switch from one type to another, depending on the variables represented. For a better understanding of these graphs and tables see the section on the java client.

When you want to make special graphs or tables, such as the waveform or harmonics, it will be necessary to use the following variables.

	Waveform					
	Voltage:			Current		
	L1	L2	L3	L1	L2	L3
	FOV1	FOV2	FOV3	FOA1	FOA2	FOA3
QNA	O	O	O	O	O	O

	Harmonics							
	Voltage				Current			
	L1	L2	L3	Neutral	L1	L2	L3	Neutral
	ARMV1	ARMV2	ARMV3	ARMVN	ARMA1	ARMA2	ARMA3	ARMVN
CVM 144					O	O	O	
CVM 96					O	O	O	
CVM K2	X	X	X	X	X	X	X	X
CVM K HAR	X	X	X		X	X	X	
CVM MINI	X	X	X		X	X	X	
CVM NET	X	X	X		X	X	X	
CVM NRG 96	X	X	X		X	X	X	
QNA	O	O	O		O	O	O	

	Maximum voltage harmonics (3 sec.)		
	L1	L2	L3
	ARMMXCV1	ARMMXCV2	ARMMXCV3
QNA	O	O	O

	Maximum voltage harmonics (10 mins.)		
	L1	L2	L3
	ARMMXPV1	ARMMXPV2	ARMMXPV3
QNA	O	O	O

	Events					
	Duration			effective semi-circle voltage		
	L1	L2	L3	L1	L2	L3
	DEVQ1	DEVQ2	DEVQ3	VEVQ1	VEVQ2	VEVQ3
QNA	X	X	X	X	X	X

	Billing closures
	TCLW
CIRWATT	X

2.1.13 Device status

Sometimes it will be necessary to know the status of a device, for example when you want to activate an event when a device stops communicating. Use the STATUS variable to determine device status.

name. *STATUS*

The following are the possible values.

Device status	*Value*
The device is working properly.	1
Device not initialized, initial communication with the device has not been established.	4
Downloading data with ZModem	17
The communication port is incorrect or nonexistent.	18
Camera is working and downloading images by streaming	33
Communication errors.	34
Camera is working but not downloading images by streaming	65
The type of device you are trying to communicate with is different to the specified device.	66
Downloading files from device.	129

The device communicates correctly, but it detects that some of the phases are poorly connected.	130
The version of the device is incompatible with the software.	258
The SD Memory Card is invalid, write-protected or not present.	514

2.1.14 Event Variables[10]

The event variables will be coded for use in formulas and expressions such as

R$EVE_variable. name

Using the *R$EVE* prefix tells the program this is an event variable rather than a device variable.

The following is a table with the different variables associated with each event

Identifier	*Description*
ST	Event status (0:disabled, 1:Enabled)
TACT	Time the event has been active, the value is 0 when the event is disabled
CACT [1]	Counter of the number of activations
CDIS [1]	Counter of the number of deactivations
CACK [1] [2]	Counter of the number of recognitions
CTIM [1]	% Of consultation period time that the incident is enabled

[1] Only if the event is recorded in a file
[2] Only if the incident is reported

[10] Only in SCADA and Deluxe versions

3.- MAINTENANCE AND TECHNICAL SERVICE

In the case of any query in relation to unit operation or malfunction, please contact the **CIRCUTOR, SA** Technical Support Service.

Technical Assistance Service

Vial Sant Jordi, s/n 08232 - Viladecavalls (Barcelona)
Tel.: 902 449 459 (Spain) / +34 937 452 900 (outside of Spain)
email: sat@circutor.es

4.- GUARANTEE

CIRCUTOR guarantees its products against any manufacturing defect for two years after the delivery of the units.

CIRCUTOR will repair or replace any defective factory product returned during the guarantee period.

- No returns will be accepted and no unit will be repaired or replaced if it is not accompanied by a report indicating the defect detected or the reason for the return.
- The guarantee will be void if the units has been improperly used or the storage, installation and maintenance instructions listed in this manual have not been followed. "Improper usage" is defined as any operating or storage condition contrary to the national electrical code or that surpasses the limits indicated in the technical and environmental features of this manual.
- **CIRCUTOR** accepts no liability due to the possible damage to the unit or other parts of the installation, nor will it cover any possible sanctions derived from a possible failure, improper installation or "improper usage" of the unit. Consequently, this guarantee does not apply to failures occurring in the following cases:
  - Overvoltages and/or electrical disturbances in the supply;
  - Water, if the product does not have the appropriate IP classification;
  - Poor ventilation and/or excessive temperatures;
  - Improper installation and/or lack of maintenance;
  - Buyer repairs or modifications without the manufacturer's authorisation.

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